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Original Research Article

MATERNAL NEAR MISS: A RETROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Maternal mortality is a critical indicator to assess the quality of services provided by a health care system. Globally, there has been decline in MMR. In India too this is declining steadily. There is a need to further accelerate this decline for achieving our national and international goals. **Materials and Methods:** A retrospective observational study of obstetric near miss cases was conducted at a tertiary care centre, the Department of Obstetrics and Gynaecology, Thanjavur Medical College, Thanjavur from Jan 2024 – Dec 2024 for the study period of 12 months. The study population comprised of all obstetric nearmiss Pregnant women till 42 days of delivery/ termination of pregnancy, fulfilling the NHM criteria during the study period. **Result:** The total number of deliveries during the study period was 11340. Total number of near miss cases was 70 and total number of maternal mortality was 19.MNM incidence ratio of 6.2 per 1000 livebirth and maternal nearmiss-mortality ratio of about 3.6:1. The most common factors leading on to near miss were found to be Haemorrhage followed by hypertensive disorders of pregnancy **Conclusion:** Haemorrhage (36%) was the leading cause of MNM followed by hypertensive disorders of pregnancy. Improving timely access to health care and improving the quality of antenatal care provided to pregnant mothers with quality critical care management can reduce maternal near miss cases.

INTRODUCTION

Maternal mortality is considered a key indicator of health services that are offered by a government. It is often referred to as 'Just the tip of the iceberg', suggesting that there is a big base to the iceberg in the form of maternal morbidities or maternal near misses, which have not received much attention.2 Maternal Health is the one of the most sensitive indicators of the health care system. The Maternal Death Review (MDR) guidelines launched by Government of India is a tool available with health managers and policy makers at various levels to critically look at health system performance, identify gaps and initiate corrective steps through convergent action. A major limitation of the MDR process is that the health professionals and other stake holders involved in the service delivery fear that the great misfortune that has fallen on the pregnant mother puts the blame squarely on their shoulders.[1] Moreover, the mother who interacted with the system was not available to share her experience. Despite therapeutic advances in medical science and a growing perception of the safety of childbirth; morbidity and mortality continue to occur in obstetrics especially in developing countries like India.

In 2014, NHM came up with the criteria to classify Pregnant women under near miss and defines MNM as 'A woman who survives severe life threatening condition, either after receiving emergency medical/ surgical intervention or otherwise, during pregnancy, abortion, childbirth or within 42 days of Pregnancy termination.[1]

Maternal near miss has emerged as an adjunct to the investigation of maternal death as the two represent similar pathological and circumstantial factors leading to severe maternal outcomes. Thus there is a need for the application of maternal near miss concept for the assessment of maternal health and the quality of maternal health care. All the near misses should be interpreted as free lessons and opportunities to improve the quality of service provision.[1]

Primary objective of this study is to analyse the series of events a near miss case experiences, management protocols and emergency interventions.

Secondary objective is to investigate the antenatal History, medical disease/ high risk factor, type of

delay or the factors that caused the initiating morbidity in these cases.

The following statistics are studied:

1. MNM ratio (MNMR) refers to the number of maternal Near miss cases per 1,000 live birth (MNMR = MNM/LB)
2. Maternal near miss- mortality ratio: (MNM:MD) refers to the ratio between MNM cases and maternal deaths (MD)
3. Women with life threatening condition(WLTC): refers to all women who either qualified as maternal near miss cases or those who died. It is the sum of maternal near miss and maternal deaths (WLTC=MNM +MD)
4. Severe maternal outcome ratio (SMOR) refers to the number of women with life threatening condition per 1000 livebirth (LB) SMOR=MNM+MD/LB

MATERIALS AND METHODS

This retrospective cross-sectional observational study was carried out in the Department of Obstetrics and Gynecology at Thanjavur Medical College from Jan 2024 to Dec 2024. This study involves all Pregnant women or recently delivered women admitted to Thanjavur Medical College during this study period who nearly died but survived a complication during pregnancy and childbirth or within 42 days of pregnancy termination based on NHM 2014 criteria.[1]

Near miss indices:

Indices:

1. Total no. of deliveries – 11340
2. Total no of livebirths – 11262
3. No. of near miss cases (MNM) – 70
4. No. of Maternal mortality cases- 19
5. Maternal near miss incidence ratio – 6.2/1000 livebirth
6. Maternal near miss mortality ratio (MMR = MM/LB) - 3.6:1
7. Severe maternal outcome ratio (SMOR = MNM+MD/LB) -7.9/1000 LB

RESULTS

In our study during Jan 2024 – Dec 2024, Total no. of deliveries 11340 and Near miss cases found to be 70.

Distribution according to patient characteristics:

Table 1

Age	JAN 2024 -DEC2024	
	N	%
≤ 20	3	4%
21-25	15	21.4%
26-30	26	37.14%
31-35	12	17.1%
≥ 35yrs	14	20%

Table 2

Gravida	JAN 2024 –DEC 2024	
	N	%
Primi	22	31.4%
G2	20	28.57%
≥ G3	28	40%

Table 3

Gestational weeks	JAN 2024 –DEC 2024	
	N	%
< 12 wks	7	10%
12-28	10	14.28%
≥ 28 wks	53	75.7%

Table 4

ANC/PNC status	JAN 2024 –DEC 2024	
	N	%
ANC	57	81.4%
PNC	13	18.57%

Table 5

Admission status	2023 -2024	2024 -2025
Unreferred	30	42.8%
Referred	40	57.1%

Table 6: Duration of admission:

< 10 days	24	34.38%
>10 days	46	65.7%

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Table 7: Blood/ Blood Products

Required	32
Not required	38

Critical life saving interventions done in study cases:

1. ICU admission – 70
2. Intubation and MV – 12
3. NIV- 5
4. Ionotropic support – 12
5. Dialysis – 2
6. Ketoacidosis management – 2
7. Obstetric Hysterectomy – 17
8. Emergency Laparotomy and proceed– 3
9. Therapeutic Heparinization – 1
10. Blood and product transfusion-32

Distribution of Primary Determinants of Nearmiss

1. Hemorrhage - 28
   a. Ruptured Ectopic - 3
   b. PPH – 4
   c. Morbidly Adherent Placenta -16
   d. Abruption -5
2. Hypertensive disorder – 13
   a. severe Preeclampsia – 4
   b. Eclampsia -9
3. Heart disease with complications – 6
4. Complicated Dengue – 4
5. Scrub with MODS – 8
6. KI – 2
7. Liver disorder -2
8. Others -3
9. Sepsis – 4
10. Pulmonary complications – 1
11. Thrombocytopenia with bleeding – 4

Table 8: Mode of delivery and Surgical Interventions

Cesarean section	33	47.14%
Labor Natural	10	14%
Manual Vacuum Aspiration	4	5.7%
Ante natal	1	1%
Laparotomy for ruptured ectopic	3	4.3%
Peripartum hysterectomy	17	24.3%

Prevalence rate: In our study, deliveries during the study period Jan 2024 – Dec 2024 was 11340 and near miss cases was found to be 70. Maternal near miss incidence ratio was 6.2/1000 livebirths and Total maternal mortality cases was found to be 19. Maternal near miss: Maternal mortality ratio of 3.6:1

Age: The study had 37.14% of the near miss cases falling in the age group between 26 and 30 and 21.4% between 21 and 25yrs, and 20% in the age group ≥ 35yrs

Parity: In this study, 31.4% were primigravida, 28.57% were 2nd gravida and 40% were 3rd gravida and more.

About 57.1% of cases were referred and 30% of cases got admitted by themselves. In our study Hemorrhage is the most common determinant leading to near miss. Out of 70 near miss cases, 40 % were due to hemorrhage. Among 40 % (28 cases) near miss cases due to hemorrhage, 3 (4.9%) of them presented with ruptured ectopic in shock, 5 (7.1%) were due to Abruption, 4 (5.8%) of them were due to PPH and 16 (22.9%) with morbidity Adherent Placenta(MAP). Following hemorrhage, Hypertensive disorders of pregnancy accounts for 18.5% (13 cases). Infections due to Dengue and scrub typhus accounts for 17.14% (12) of cases. Out of these 12 cases, scrub typhus accounts for 11.42% (8) of cases. All of the patients with scrub typhus presented with fever/DIVC/shock and required intubation/NIV/Blood and blood products transfusion. Eschar could be identified only in 5 cases.

All near miss cases required admission in the critical care unit. About 17.1% (12) cases required intubation and 5 (7.14%) cases required non invasive ventilation. Ionotropic support was needed in 12 (17.1%) of near miss cases. About 28.6% (20) of the near miss cases required surgical intervention to save the life of the patient. Among 28.6% of surgical interventions, 17 cases undergone obstetric hysterectomy and 3 cases required emergency laparotomy with ectopic excision.

About 32 cases (45.7%) required blood transfusion. If done at the right time in right quantity for indicated cases, blood transfusion alone saves the life and avoid severe morbidity. About 17 cases (24.3%) who underwent Obstetric hysterectomy, 16 were morbidity adherent placenta and 1 for atonic PPH (which was complicated by multiple fibroid uterus). Hence C- section audit is mandatory and C- section on maternal request has to be avoided.

DISCUSSION

In our study, majority of the MNM cases are in age of 26-30 years and this could be probably due to a large no. of pregnancies and deliveries happen in this age group. The findings are similar to the study conducted by Sunanda N et al,[4] Int J Reprod Contracept Obstet and Gynaecol 2023. In the study by Nayana et.al., 2024: majority of near miss were in age group between 21 to 30 years (63.2%). In similar study by Pumma et.at., 2018, majority was between 20-25 years 7 whereas Singh Abha et al., reported 21 -30 years as the most common age group involved. In study by Jena et al, 2024, majority were in age group 31-35 years (66.19%).[1-8]

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In our study, in women above age of 30, the nearmiss incidence is 26 cases which is equal to the number in the age group of 25-30 years. This signifies that as age advances maternal morbidities increase.

In our study, majority of the MNM cases 40% are multiparas which correlates to the study by Sunanda N et al, 2023 and Teshome HN et al, 2022 who reported 55.4% and 90.9% respectively in their study.[4,5] Similarly, in study by Jena et al,[2] 2024 near miss cases reported in 67.61% of multiparas. In study by Nayana et al,[3] 2024, multigravida was more in number as compared to primigravida (60.91%). Advancing age and frequent childbirth predisposes to medical disorders and obstetric complications.

In our study most of the maternal near misses occurred in the third trimester (75.7%) which was similar to the study conducted by Nayana et al,[3] 2024 (58.62%). Obviously most medical and obstetric complications manifest and aggravate as pregnancy advances.

In our study, 18.57% patients were in postpartum period on presentation while in similar study by Pumma et al,[7] 2018, 29.11% patient were postpartum. In study by Nayana et al,[3] 2024, maternal mortality occurs more in third trimester and postnatal period (38.5%). This signifies the need for educating the patient about warning symptoms, danger signs, frequent AN checkup in advanced pregnancy, improving quality of care during the postpartum period and proper puerperal follow up.

The incidence of maternal near miss in our study was 6.2/1000 live births which is lower than the study by Jena et al,[2] 2024 who reported incidence of 10.2/1000 live birth. In their study total cases was 2784 and maternal mortality was found to be 48 during the study period. In our study number of maternal mortality cases were 19 and MNM cases 70. In another study by Pumma et al,[7] Vol 8; Issue 1, Jan 2018: maternal near miss incidence was found to be 16.26 per 1000 live births which was higher than our study. In their study total cases included in study was 10,747 and total number of maternal mortality and maternal near miss cases was found to be 92 and 158 respectively. In another study by Nayana et al,[3] Vol 14, Issue 3, July-Sep, 2024: maternal near miss incidence was found to be13.38 per 1000 live births. In their study total deliveries was 5714. Total maternal near miss and maternal death was found to be 174 and 13 cases respectively

In our study, hemorrhage is the most common primary determinant of near miss. In the study by Preeti Frank Leuis et al, Bindu Gundaiah et al, 29 Nov 2022; Journal of South Asia Federation of Obstetrics and Gynecology, Volume 15 Issue 4 (July – Aug 2023), Hemorrhage accounted for 36 % of near miss. Of which ectopic pregnancy constituted about 10%; PPH and Placenta previa about 8.3% each. In our present study, morbidly adherent placenta is the major cause of Hemorrhage which constitutes about 22.8% %. In another study by Sunanda N et al,[4] May 2023; Hypertension and its complication were the most common cause (33%) for maternal near miss followed by obstetric hemorrhage (26.3%). In another study by Pumma Mehak et al, Jan 2018: Hemorrhage was the leading cause of maternal near miss (44.94%) which is similar to our study.[7] In study by Nayana et.al., 2024 hemorrhage (55.74%) leading cause of MNM followed by hypertensive disorders in pregnancy (37.93%) which was similar to our study.[3] But in study by Jena et.al.,2024, PIH/eclampsia (48.59%) was the leading cause of maternal near misses followed by ruptured ectopic.[2]

In our study, higher rates of C-section (47.14%)were noted compared to vaginal delivery, which is acceptable among women who develop severe morbidity due to the urgency required.

In our current study scrub typhus accounts for about 11.42% (8) of near miss cases. Most of the patients present with shock and need intubation. Some patients had eschar and most of them had thrombocytopenia. One patient presented DIVC. If diagnosed and treatment started earlier, maternal and fetal prognosis can be favorable. An early diagnosis is critical in managing pregnancy with scrub typhus as most of the affected patients have nonspecific presentation which can be early confused with other acute febrile illness like typhoid, dengue and leptospirosis. As clinician a strong index of suspicion and being vigilant about the cases of fever especially in pregnant women.

We had a higher rate of ICU admission than reported in other similar studies. Almost all patient needs ICU care and management. This could be attributed to fact that most of the patients were brought in critical state /decompensated shock and needed ICU for stabilization.

CONCLUSION

Hemorrhage is the leading cause of MNM. Vigorous resuscitation to prevent and Early detection of shock and availability and proper usage of blood and blood products and facilities and expertise for emergency surgeries have decreased mortality in cases of hemorrhage. Regular and more frequent AN care with proper BP monitoring and education on warning symptoms and danger signs would decrease morbidity and mortality due to hypertensive disorders as lack of education and late presentation is one of the major cause of morbidity. Along with increased awareness of one's own health, health education may go a long way in improving the quality of obstetric care. Women should be made aware about the disease and its complications by proper health education and emphasis on prenatal counselling.

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