

**“BEFORE IT’S TOO LATE....”****A CLINICAL STUDY OF MATERNAL NEAR MISS CASES AT  
TERTIARY CARE CENTRE.**

Dr. Priyanka Kesharwani<sup>1</sup>, Dr. Prashant Bhingare<sup>2</sup>, Dr. Srinivas Gaddapa<sup>3</sup>

1. Junior Resident, Dept. of OBGY. Govt. Medical College, Aurangabad, India (kesharwanidr.priyanka@gmail.com)

2. Academic Professor, , Dept.of OBGY Govt. Medical College, Aurangabad, India (pebhinagre@yahoo.co.in)

3. Professor & Head, Dept.of OBGY Govt. Medical College, Aurangabad, India, (shrinivasgadappa@gmail.com)

**ABSTRACT**

---

**Background:** In India there is a decline in MMR compared to 2010 statistics. Severe Acute Maternal Morbidity (SAMM) has been introduced to analyze the quality of the health care system, thus to improve the obstetric care. SAMM and Near Miss events are complimentary to MMR. This concept was defined by the World Health Organization (WHO) as “a woman who, being close to death, survives a complication that occurred during pregnancy, delivery or up to 42 days after the end of her pregnancy”.

**Aim:** To estimate the magnitude, associated Morbidity, various interventions and maternal and perinatal outcome for near miss cases (MNM) at tertiary care center.

**Method:** The prospective observational study was conducted in a Government medical college and hospital, Aurangabad from 2018 to 2020 after Institution Ethics Committee approval. Data of 350 near miss cases were analysed and also categorized based on adverse event identified in 1) Pregnancy Specific Obstetric and Medical disorder 2) Pre-Existing disorders aggravated during pregnancy 3) Accidental/Incidental disorders of pregnancy.

**Results:** The magnitude of near miss cases (MNM) was found to be 1.10 per 1000 live birth and maternal mortality (MMR) observed was 0.41 per 1000 live birth. Maternal near miss to maternal death ratio was 2.71:1. In present study anaemia (65.43%) and PIH (64.29%) was associated risk factors of maternal near miss. Further it was seen that the causes of MNM was Atonic PPH in 64% of cases followed by severe preeclampsia in 54% of cases.

**Conclusion:** It can be concluded from this study that hemorrhage during pregnancy are the most common cause maternal morbidity in the study group, followed by ruptured ectopic pregnancy. Hence, services at the grass route level helps in early identification, treatment and proper referral of complicated pregnancies should be made available. Proper in-semination IEC activities of the primary health care staff about the complication among the antenatal mothers, their referral and further evaluation of the disorder should be given.

**Keywords:** WHO, SAMM, MNM, MMR, PIH, PPH.

---

**INTRODUCTION**

Although there has been considerable progress in maternal and newborn health over the past two decades, provision of high-quality care for women once they reach health care facilities has emerged as an important challenge.<sup>1</sup> Poor quality of care at the time of birth hampers health outcomes for women, children and communities; and research efforts should identify ways to improve the current state of affairs.

In India there is a decline in MMR compared to 2010 statistics. Severe Acute Maternal Morbidity (SAMM) has been introduced to analyze the quality of the health care system, thus to improve the obstetric care. SAMM and Near Miss events are complimentary to MMR.<sup>2</sup> Maternal Near Miss is defined as a woman who nearly died but survived a complication during pregnancy, childbirth or within 42 days of termination of pregnancy.<sup>2,3</sup>

The term “Near-Miss” describes a serious adverse event that only failed to occur by luck or by chance or by adequate management. This concept was defined by the World Health Organization (WHO) as “a woman who, being close to death, survives a complication that occurred during pregnancy, delivery or up to 42 days after the end of her pregnancy”<sup>4,5</sup>. Maternal near-miss (MNM) cases occur more often than maternal deaths and may give more information because the woman herself can be a source of data<sup>6</sup>. MNM 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<sup>7</sup>.

There are three delays which have been identified to analyse the gaps in the management of obstetric emergencies leading to severe maternal complications and death. These are 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> delay. In developing countries like India 75% of women with obstetric complications are already in critical condition when they arrive at a tertiary care. Hence the medical staff at the peripheral health centers should be made aware of the danger signals and utilization of maternal near miss reviews done<sup>8</sup>.

### **AIMS AND OBJECTIVES**

- To study the magnitude of near miss cases.
- To study Morbidity associated with Near Miss.
- To study Maternal and Perinatal Outcome.
- To study various interventions for management of maternal near miss cases.

### **METHODS**

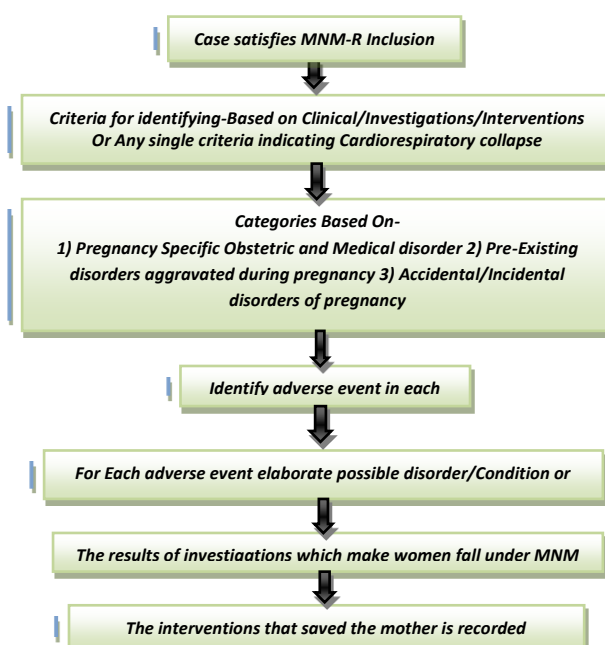
A prospective observational study was conducted after Institution Ethics Committee permission in Department of OBGY, GMCH Aurangabad, from 2018 to 2020, among 350 women coming for antenatal check-up, who were fitting into inclusion criteria and who gave their consent for participation.

#### **Inclusion criteria:**

- All near miss cases who give consent to be included in study at our tertiary care center.
- All cases that fulfil the criteria of maternal near miss cases..

#### **Exclusion criteria:**

- Cases near miss manage outside our hospital
- All women those develop condition unrelated to pregnancy (i.e. not during pregnancy or 42 days after termination of pregnancy).
- Patients who do not give consent to be included in study.

Diagnosis of MNM:Critical Delay

Each and every case of maternal near miss will be classified according to the mode of delay in one of the three delays as per the "three delays" protocol commonly used in maternal mortality cases

On analysis of data, observations were noted and results were formulated. Quantitative data presented in the forms of frequency and percentage.

**RESULTS AND DISCUSSION**

A total 31695 women delivered in the study period, out of which 350 cases of maternal near miss were analysed.

**Table 1: Magnitude of Maternal Near miss**

Magnitude	Frequency	Per 1000 live birth
Maternal Near Miss	350	01.10
Maternal mortality	129	00.41

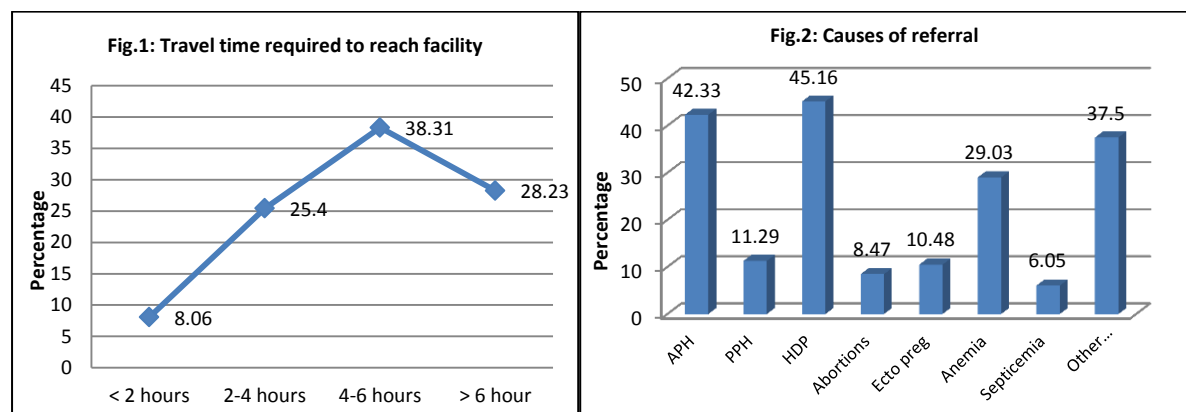
In the present study maternal near miss to Maternal death ratio is 2.71:1. Near miss cases generally occur more frequently than maternal deaths and therefore a more reliable Quantative analysis can be carried out. {Table 1}

**Table 2: Distribution according to Baseline Characteristics (n=350)**

Characteristics	Frequency	Percentage	
<b>Age in Years</b>	>20	53	15.14
	>20-25	149	42.57
	>25-30	106	30.29
	>30-35	35	10.00
	>35	07	02.00
<b>Booking Status</b>	Unbooked	283	80.86
	Booked	67	19.14
<b>Residence</b>	Urban	149	42.57
	Rural	201	57.43
<b>Socio-economic Status</b>	Upper Class	00	00.00
	UMC	14	04.00
	LMC	166	47.43
	ULC	66	18.86
	Lower Class	104	29.71
<b>Educational Status</b>	Illiterate	11	03.14
	Upto 6th standard	127	36.29
	6-12th standard	172	49.14
	> 12th standard	40	11.43
<b>Gestational Age</b>	1 <sup>st</sup> Trimester	16	04.57
	2 <sup>nd</sup> Trimester	31	08.86
	3 <sup>rd</sup> Trimester	243	69.43
	Puerperium	60	17.14

\*Socioeconomic status is according to Modified Kuppuswamy Scale.

Majority of cases (42.57%) were in the age group of 20-25 years. The mean age was found to be  $25.50 \pm 4.63$ . Majority of near miss (80.86%) were in unbooked cases. It was observed that around 57.43% mothers belonged to rural areas and 47.43% mothers belonged to lower middle-class family. Most of the women were having education between 6-12<sup>th</sup> Std. i.e. 172 (49.14%). In this study, majority near miss cases were came at 3<sup>rd</sup> trimester 69.43% and in our study 70.86% cases were referred. { Table 2}.



Most of cases 38.31% required 4-6 hours to reach our facility. In most of cases cause of referral was Hypertensive disorders of Pregnancy 45.16 %. Second most common cause of referral was APH (42.33%). 29.03% cases were referred due to anaemia & its complications.

**Table 3: Associated Maternal Risk Factors of near miss**

Maternal Risk factors	Frequency	Percentage
Anemia	229	65.43
PIH	225	64.29
IUFD	55	15.71
Previous LSCS	64	18.29
Heart Disease	17	04.86
Other Medical Disorder	20	05.71
No any illness	66	18.86

The majority of near miss cases (65.43%) were associated with anaemia of pregnancy. Other observed maternal risk factor were hypertensive disorder of pregnancy in 64.29%, previous LSCS in 18.29%, IUFD in 15.71%, heart disease in 4.86% and other medical disorder in 5.71%. {Table 3}

**Table 4: Causes of near miss**

Maternal Risk factors	Frequency	Percentage
Placenta Previa	61	17.43
Abruptio Placenta	122	34.86
Hepatitis	29	08.29
Sepsis	21	06.00
Severe Preeclampsia	189	54.00
Accreta Spectrum	40	11.42
Ectopic pregnancy	26	07.42
Rupture Uterus	24	06.86
Inversion of Uterus	02	00.57
Eclampsia	30	08.57
Atonic PPH	224	64.00
Anemia/HELLP	72	20.57
Traumatic PPH	16	04.57
Placenta Previa	61	17.43

Atonic PPH was seen in 64% of cases followed by Severe preeclampsia was observed in 54% of cases. In 34.86% cases abruptio placenta was observed. HELLP syndrome was seen in 20.57% of cases. {Table 4}

**Table 5: Maternal & Fetal outcome (n=350)**

Characteristics	Frequency	Percentage	
Maternal Outcome			
Mode of	Vaginal delivery	81	23.14

delivery	Emergency LSCS	166	47.43
	Exploratory Laparotomy	42	12.00
	Hysterectomy	46	13.14
	Vaginal delivery +Exploratory. Laparotomy	05	01.43
	Exploratory. Laparotomy + Hysterectomy	09	02.57
	Vaginal delivery+ Hysterectomy	01	00.31
ICU stay of Mother	1-2 days	99	28.28
	2-5 days	81	23.14
	>5 days	38	10.85
	Not required	132	37.71
Fetal Outcome	Live	128	36.57
	IUFD	69	19.71
	Neonatal Death	45	12.86
	NICU admission	61	17.43
	Abortion	21	06.00
	Ectopic	26	07.43

Among all the cases, Most common mode of delivery was emergency LSCS which was 49.20% whereas 24.40% were delivered vaginally. Most of cases 37.71% were not required ICU stay. About 28.28% cases required ICU stay for 1-2 days. Only 10.85% cases had >5 days of ICU stay.

In most of the cases 42.24% fetus was alive which indicates better fetomaternal Outcome and in 20.13% cases required NICU admission which eventually recovered and went healthy with mother. {Table 5}

**Table 6: Critical Delay**

Critical delay	Frequency	Percentage
Delay 1	211	60.29
Delay 2	90	25.71
Delay 3	00	00
No Delay	49	14.00

The most common delay associated with near miss was observed to be type 1 delay in 60.29% i.e. delay in decision to seek care followed by delay 2 in 25.71%, no any cases of delay 3 and no delay in 49 (14%). {Table 6}

## DISCUSSION

The near miss approach has been suggested to evaluate and improve the quality of care provided by the health system. By reviewing near miss cases we can learn about the processes and their deficiencies that are in place for the care of pregnant women. This would result in identifying the pattern of severe maternal morbidity and mortality, strengths and weakness in the referral system and the clinical interventions available and the ways in which improvements can be made.

Recent studies in developing countries have reported the near miss ratio ranges from 2 to 12 per 1000 live births<sup>9</sup>. In our study it was found 11.04 per 1000. Many studies that have used the criteria based

on organ system dysfunction have reported a higher prevalence of near miss than our study. This could be because the WHO near-miss criteria have been modified in these studies. In the present study maternal near miss to Maternal death ratio is 2.71:1. In our study ratio was very less comparable to the study done by Samant PY et.al. found that the near miss to mortality ratio was 14.2:1.

In present study 19.15% of mothers were booked & 80.85 % were unbooked. This findings was comparable to study by Samant PY et.al.<sup>10</sup> and Mansuri F. et.al.<sup>11</sup>

In present study most of mothers 253 (72.29%) were at 3rd trimester and 16 (4.57%) were at 1st trimester. The findings are comparable with other studies Gupta D et al.<sup>12</sup> and Singh V. et. al<sup>13</sup>.

In our study most common cause of MNM observed was atonic PPH 224 (64%) followed by severe pre eclampsia 189 (54%). The findings are comparable with Reena RP. et al.<sup>14</sup> and Gupta D et al.<sup>12</sup> Variability of findings observed due to different cohort, size of samples and different settings.

In present study the most common delay associated with still birth was observed type 1 delay 60.29% i.e. delay in decision to seek care. As ours is a tertiary care center with a number of cases referred from outside, availability of trained obstetricians and emergency LSCS facilities round the clock, intense intrapartum monitoring with practices such as CTG monitoring and birth companion no type 3 delay in our study as compared to other studies.

## CONCLUSION

Hemorrhages during pregnancy are the most common cause maternal morbidity in the study group, followed by Hypertensive disorders of pregnancy. Hence, services at the grass route level helps in early identification, treatment and proper referral of complicated pregnancies should be made available. Proper insemination IEC activities of the primary health care staff about the complication among the antenatal mothers, their referral and further evaluation of the disorder should be given.

The next major cause of maternal near miss is hypertensive disorder of pregnancy (HDP). Creating awareness among the general population about HDP and its complications, motivating them to do regular BP monitoring and necessary investigation and regular follow up during pregnancy would alleviate the morbidities due to hypertension.

## REFERENCES

1. Akachi Y, Kruk ME. Quality of care: measuring a neglected driver of improved health. *Bulletin of the World Health Organization* 2017; 95(6): 465-72.
2. PS R, Verma S, Rai L, Kumar P, Pai MV, Shetty J. "Near Miss" Obstetric Events and Maternal Deaths in a Tertiary Care Hospital: An Audit. *J Pregnancy*. 2013 Jun 26;2013.
3. Purandare CN. Maternal near miss review: a way forward. *J Obstet Gynaecol India*. 2103;63(4):213-5.
4. Lotufo FA, Parpinelli MA, Haddad SM, et al. Applying the new concept of maternal near-miss in an intensive care unit. *Clinics (Sao Paulo)* 2012;67(225):230.
5. Say L, Souza J, Pattinson R, et al. WHO working group on maternal mortality and morbidity classifications. maternal near miss—towards a standard tool for monitoring quality of maternal health care. *Best Pract Res Clin Obstet Gynaecol*. 2009;23(3):287–296. doi: 10.1016/j.bpobgyn.2009.01.007.
6. Souza J, Cecatti J, Parpinelli M, et al. Appropriate criteria for identification of near-miss maternal morbidity in tertiary care facilities: a cross sectional study. *BMC Pregnancy and Childbirth*. 2007;7(1):20. doi: 10.1186/1471-2393-7-20.

7. Amaral E, Souza J, Surita F, et al. A population-based surveillance study on severe acute maternal morbidity (near-miss) and adverse perinatal outcomes in Campinas, Brazil: the Vigimoma Project. *BMC Pregnancy and Childbirth*. 2011;11(1):9. doi: 10.1186/1471-2393-11-9.
8. Actis Danna V, Bedwell C, Wakasiaka S, Lavender T. Utility of the three-delays model and its potential for supporting a solution-based approach to accessing intrapartum care in low-and middle-income countries. A qualitative evidence synthesis. *Global health action*. 2020 Dec 31;13(1):1819052.
9. Chhabra P. Maternal near miss: an indicator for maternal health and maternal care. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*. 2014 Jul;39(3):132.
10. Samant PY, Dhanawat J. Maternal near miss: an Indian tertiary care centre audit.
11. Mansuri F, Mall A. Analysis of maternal near miss at tertiary level hospitals, Ahmedabad: A valuable indicator for maternal health care. *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine*. 2019 Jul;44(3):217.
12. Gupta D, Nandi A, Noor N, Joshi T, Bhargava M. Incidence of maternal near miss and mortality cases in central India tertiary care centre and evaluation of various causes. *The New Indian Journal of OBGYN*. 2018; 4(2): 112-6.
13. Singh V, Barik A. Maternal Near-Miss as a Surrogate Indicator of the Quality of Obstetric Care: A Study in a Tertiary Care Hospital in Eastern India. *Cureus*. 2021 Jan;13(1).
14. Reena R P, Radha K R. Factors associated with maternal near miss: A study from Kerala. *Indian J Public Health* 2018;62:58-60.