



A STUDY OF NEAR MISS CASES IN A TERTIARY CARE CENTRE AS PER LAQSHYA GUIDELINES

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ABSTRACT

Introduction: Maternal health is an indispensable part of a country's health care system. Over the last decade, the identification of cases of maternal morbidity has emerged as an adjunct to the investigation of maternal deaths. Maternal Near Miss (MNM) has been defined as "a woman who survives life threatening conditions during pregnancy, abortion, and childbirth or within 42 days of pregnancy termination, irrespective of receiving emergency medical/surgical Interventions". **Materials and Methods:** It was a hospital based observational study conducted from June 2020 to May 2021 in the Department of Obstetrics and Gynaecology at Rajindra Hospital, Patiala. Majority of the studies conducted on MNM in India are based on guidelines given by WHO. MNM cases in our study were selected on the criteria based on the MNM-Review Operational guidelines issued by ministry of health and family welfare in 2014. The common causes of MNM events were analyzed. Various indices such as the incidence of MNM in our hospital, MNM-MR, MI, SMOR were calculated and the fetal outcome in patients classified as MNM was studied. **Results:** There were 3171 live births, 206 near miss cases and 78 maternal deaths during the study period. The most common direct cause of maternal near miss in our study was haemorrhage (47.1%) which was followed by sepsis(23.8%), infections(9.7%), anaemia(9.3%) and hypertensive disorders(5.8%). MNM-MR in our study was 2.64:1, MNM-IR was 64.96 per 1000 live births, MI was 27.46% while SMOR was 89.56. **Conclusion:** Near miss mortality indicator is helpful in identifying life-threatening conditions and thus aim to prevent maternal mortality. Identification of preventable factors and preventive actions can be taken for management of complications in future near-miss cases.

KEYWORDS : Maternal Near Miss, Mortality Index, Severe Mortality Outcome Ratio, Mortality Index

INTRODUCTION

Maternal health is an indispensable part of a country's health care system.[1] Despite the advances in the medical sciences in the last century, morbidity and mortality continue to occur in women.[2] Even in India, pregnancy-related mortality and morbidity continue to affect the lives of women and their newborns.[3]

Over the last decade, the identification of cases of maternal morbidity has emerged as an adjunct to the investigation of maternal deaths. Analysis of well defined near miss cases has come out to be an essential measure of the standard of obstetric care.[4] Maternal Near Miss (MNM) has been defined as "a woman who survives life threatening conditions during pregnancy, abortion, and childbirth or within 42 days of pregnancy termination, irrespective of receiving emergency medical/surgical Interventions". [5]

In any setting, women who develop severe complications during pregnancy share many pathological and circumstantial factors with the women who die. By evaluating these cases with severe maternal outcomes, a lot can be learnt about the care of pregnant women.[6] It helps health professionals to improve obstetric policies and practices.[7]

Due to the success of modern medicine and the increase in the number of hospital deliveries, maternal deaths are rare in developed countries nowadays, which has led to an increased interest in studying so-called "near miss" events.[8]. Even in India, MMR has been reduced to 97/lakh live births.

Near miss is a serious condition triggered by various factors such as socioeconomic, health events, health care provider competence, and substandardised facilities. [9-11] Studies have shown that maternal near misses are more common in cases with previous cesarean section, those with preexisting medical disorders, induction of labour, and lack of antenatal care. [12-16]

WHO estimates that in 2017 there were globally 295,000 maternal deaths. It represents a significant decline of 35% from the 2000 figures, but we have still not been able to

achieve the 5th Millennium Development Goal. Subsequently, sustainable development goals (SDG) were launched in the year 2015 to lower the maternal mortality rate to less than 70 by 2020. Nigeria and India had the highest estimated maternal deaths, accounting for approximately one-third (35%) of estimated maternal deaths worldwide in 2017, with 67,000 and 35,000 (23% and 12% of global maternal deaths), respectively. [17] Maternal mortality remains very high in India, with about 120 maternal deaths in a day.[18] The sad fact behind this figure is that most of these deaths are preventable.[19]

Regarding the delay model, the lack of adequate obstetric emergency care in the Indian system is thought to be caused by three delays that have been identified.

The first delay is due to lack of knowledge, which causes a delay in accessing medical facilities. The second delay is due to inability to access medical care because of lack of transportation, high costs, or socioeconomic problems. The third delay is due to inadequate care being provided at the medical facility because of the delay in diagnosis of a serious condition, decision-making, or the lack of resources or qualified medical personnel.[20]

MATERIALS AND METHODS

Study Setting

The study was conducted in the Department of Obstetrics and Gynaecology, Rajindra Hospital, Patiala, Punjab, which is a tertiary care centre and serves as a referral centre for other PHCs, CHCs and other district hospitals of Punjab and a few adjoining districts of Haryana. It was a hospital based observational study conducted from June 2020 to May 2021.

Study Population And Selection

MNM cases in our study were selected on the criteria based on the MNM-Review Operational guidelines issued by ministry of health and family welfare in 2014. The common causes of MNM events were analyzed. Various indices such as the incidence of MNM in our hospital, MNM-MR, MI, SMOR were calculated and the fetal outcome in patients classified as MNM was studied. Selection of study participants was done

from labour room and the obstetric wards irrespective of their place of delivery (delivered at our institute as well as those delivered at some other institution and referred to our centre). A written informed consent was taken from all women and only the women who consented were included in the study.

Inclusion Criteria

These guidelines classify MNM cases based on:

1. Pregnancy specific obstetric and medical disorders,
2. Pre-existing disorders aggravated during pregnancy,
3. Accidental / Incidental disorders in pregnancy.

For identification of an MNM case, the following criteria (minimum one from each category) must be met:

1. Clinical findings (either symptoms or signs),
2. Investigations
3. Interventions

Or

Any single criteria which signifies cardiorespiratory collapse

Exclusion Criteria

Women that developed these conditions unrelated to pregnancy that is, not during 42 days after the termination of pregnancy, were excluded.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp. Results on continuous measurement are presented as Mean ± SD and categorical as Frequency, percentage.

RESULTS

Table No.1 : Distribution based on demographic variables

AGE	Frequency	Percentage
<20	07	3.4
20-35	185	89.8
>35	14	6.8
Total	206	100
Mean ± SD & Range	27.08 ± 5.56	17-45
Socio-economic Status		
Upper Middle	51	24.8
Lower Middle	138	66.9
Upper Lower	17	8.3
Parity		
Primipara	71	34.34
Multipara	135	65.56
Gestational Age		
<13 weeks	43	20.9
13-28 weeks	29	14.1
>28 weeks	55	26.7
Post Natal	79	38.3
ANC Care		
No Antenatal Care	07	3.4
Less than 3 visits	161	78.2
3 or more visits	38	18.4

The majority of the near miss cases, 89.8%, were in the age group of 20-35 years which is the common reproductive age group. 6.8% of the near miss cases were from age group > 35 years, and 3.4% were from the age group < 20 years. Mean age of the population was 27.08 years.

Maximum number of cases, 66.9% belonged to lower middle socioeconomic strata, thus explaining unawareness and their failure to avail the benefits of government schemes and policies like JSSK, JSY. 25% belonged to upper middle and 8% belonged to upper lower strata.

Multiparas constitute 65.56% cases and primiparas 34.34% of the cases thus highlighting the fact that complications increase with increase in the parity of the patient.

Maximum cases fulfilling the near miss criteria 38.3% were in the postnatal period. 26.7% were at >28 weeks of gestation, 14.1% of the cases were at 13-28 weeks period of gestation, and 20.9% of the cases were at < 13 weeks of gestation.

78.2% of the cases had less than 3 visits, thus highlighting the need of improved antenatal care to reduce near miss cases.

Table 2 : MNM Criteria- Clinical Findings

Clinical Findings	Frequency	Percentage
Tachycardia >120	129	62.6
BP <90/60	82	39.8
Tachypnoea >20	40	19.41
High grade fever	35	17
Severe pallor	18	8.7
Convulsion	13	6.3
Dyspnoea	06	2.9

Table number 2 shows 39.8% cases presented with hypotension, 62.6% cases presented with tachycardia. These two findings are consistent with haemorrhage which is the most common cause of MNM in our study. 6.3% cases had convulsions emphasising the need for regular antenatal BP monitoring. Many of the cases had more than one finding. In contrast to investigations and interventional criteria, clinical criteria are an important tool for low income countries, as no complex laboratory and hospital infrastructures are required.

Table 3 : MNM - Investigations

Investigations	Frequency	Percentage
Hb <5g%	27	13.1
Abnormal echocardiography	01	0.5
platelet <50,000	03	1.5
Leucocytosis > 15000	66	32
Microbial C/s positive for organism (urine C/S, vaginal C/S and wound C/S)	10	4.9
Lesions on Chest X-ray	01	0.5
USG showing intra-uterine collection	01	0.5
Deranged kfts	01	0.5
Elevated Serum bilirubin	02	1.0
AST/ALT > 100 (Abnormal liver enzymes)	07	3.4
Spo2 <90%	03	1.5
MRI head showing abnormalities	01	0.5

Table number 3 shows 13.1% cases had Hb < 5g% most of which were due to acute haemorrhage as it is the leading cause of MNM found in our study. 32% cases had leucocytosis > 15000.

Table 4 : MNM-Interventions

Interventions	Frequency	Percentage
Circulatory collapse requiring emergency surgery	81	39.3
Shifting to 4th generation antibiotics	57	27.7
> 5 units of blood	31	15.1
ICU Admission	21	10.2
Mechanical ventilation	20	9.7
Use of cardiotonics/ vasopressor	13	6.3
Hemodialysis	2	0.9

Table number 4 shows the criteria for interventions. 39.3% cases required emergency surgery, 6.7% of which underwent peripartum hysterectomy. 27.7% cases required shifting to 4th generation antibiotics, 15.1% cases required massive blood transfusion, 10.2% required ICU admissions

Table No.5: Level Of Delays

Level of Delays	Frequency	Percentage
Personal level	45	21.84
Referral Facility	6	2.9

Delays were identified in 25.8% of the cases, of which 21.84% of the delays were at the personal levels which includes delay in decision to seek health care, which results from underestimating the severity of various pregnancy related conditions. Poor knowledge of the warning signs also play a role in this. 2.9% were at the level of referral facility. Facilities like blood bank, availability of adequate drugs, knowledge of warning signs to ensure timely referral can reduce the delays at the level of referral facility.

Table No.6: Criteria for near miss

Criteria for near miss	Frequency	Percentage
Cardiac dysfunction	01	0.5
Haemorrhage	97	47.1
Sepsis	49	23.8
Infections	20	9.7
Anaemia	19	9.3
Hypertension	12	5.8
Anaphylaxis	02	1.0
Neurological dysfunction	02	1.0
Liver dysfunction	01	0.5
Renal dysfunction	01	0.5
Respiratory dysfunction	01	0.5
Hepatic dysfunction	01	0.5

Majority of the near miss cases 47.1% were of haemorrhage. 23.8% fulfilled the criteria for sepsis. 9.7% fulfilled the infections criteria. Anaemia constituting 9.3% of the cases was an important contributing factor. Hypertensive disorders accounted for 5.8% of the cases.

Data On Maternal Death During The Study Period

17.95% of the cases of maternal deaths had no ANC visits, 50% had less than 3 visits, and 32.05% had 3 or more visits. 51.29% of the cases of maternal deaths during our study period were multiparas while 48.71% were primiparas. Whereas 65.56% of near miss in our study were multiiparas whereas 34.34% were primiparas.

Table No. 7 : Comparison of various causes of near miss and maternal deaths in our study

	Percentage of maternal near miss	Percentage of maternal deaths
Anaemia	9.3%	5.1%
Anaphylaxis	1.0%	-
Cardiac dysfunction	0.5%	1.2%
Haemorrhage	47.1%	21.79%
Hepatic dysfunction	0.5%	6.4%
Hypertension	5.8%	26.92%
Infections	9.7%	-
Liver dysfunction	0.5%	-
Neurological dysfunction	1.0%	1.2%
Renal dysfunction	0.5%	-
Respiratory dysfunction	0.5%	26.92%
Sepsis	23.8%	8.9%
Postpartum Collapse (Embolism)	-	1.28%

TABLE NO. 8: Various indices of maternal mortality and near miss cases

MNM Incidence Ratio(per 1000 live births)	64.96
MNM:MD	2.64:1
Mortality Index	27.46%

Severe Morbidity Outcome Ratio	89.56
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Maternal near miss incidence ratio in our study is 64.96, which means for every 1000 live births, there were 64.96 near miss events. The maternal near miss to maternal death ratio was 2.64:1, which means for every one maternal death, 2.64 lives were saved. Mortality Index in our study was calculated to be 27.46%. Severe Morbidity Outcome Ratio in our study was calculated to be 89.56.

DISCUSSION

The study conducted for a period of one year included 206 cases categorized as near miss cases who reported to the labour room of Department of Obstetrics and Gynaecology, Govt Medical College Patiala. In the present study, there were 3296 deliveries and 3171 live births and 206 maternal near miss cases. Number of maternal deaths in the study period was 78. This study was based on based on the Maternal Near Miss Review Operational Guidelines, released by MOHFW, Government of India in 2014. These guidelines are applicable in the Indian scenario [21]

The incidence of maternal near miss described in literature varies widely due to variations in criteria used to identify MNM cases. Most studies conducted in recent times use the WHO criteria for Maternal Near Miss but our study uses the Maternal Near Miss Review Operational Guidelines, released by MOHFW.

The wide variation in the incidence of mortality index and MNM : Maternal death ratio is dependent on various reasons. There are many issues like study design, study setting and duration of data collection. The other reason is the criteria used for identification of MNM cases. [22]

The common causes of MNM in our study were haemorrhage, sepsis and hypertensive disorders. Anaemia was an important indirect cause. It is important that mothers should be informed regarding impending warning signs of pregnancy and educated for undergoing regular ANC check-up through involvement of health workers. [22]

Mean age of patients in our study was 27.08 years which matched with the studies conducted by Bashour et al [23] and Roopa et al [5]. As far as parity of the patients was concerned, our study showed that the complications increase with increase in parity of the patient. This is similar to the other studies conducted on this topic.

Most of the cases in our study were in antenatal period, which is similar to the study by Rathod et al [4]. In the present study, maximum number of cases, 47.1% presented with haemorrhage which matched with Tenaw et al. [24], and Chikadaya et al [25]. Maximum number of interventions in our study was emergency surgery accounting for 39.3% which was comparable with Kumari et al [26] which had emergency surgery in 36.1%. The criteria used in other studies included only peripartum hysterectomy, which was present in 5.21% in Pandey et al. [7] and 3.53% in Raja kumari et al. This highlights the importance of the recognition of warning signs and need for timely referral in cases of haemorrhage.

In our study, 16.5% of the cases required massive blood transfusion, that is, more than 5 prbc transfusions. Massive blood transfusion was present in 38% of the study conducted by Pandey et al. and 31 % of the cases in Rajakumari et al. [27]

Majority of the women who became Near Misses had less than 3 visits which highlights the importance of ground level workers, that is, Asha workers and ANMs as they are the first point of contact between patients and the health facilities.

The operational guidelines give equal importance to the

clinical findings as to the investigations and interventions. This is important in low resource settings like India where many investigations may not be available at all centres all the times and decisions have to be made based on clinical conditions of the patients.

Amongst the delays identified, 21.84% had delays at personal level and 2.9% at the level of referral facility which can be reduced by patient information and awareness.

CONCLUSION

As expected, in resource-limited countries like India, more women suffer and die as compared to the western and European countries, mainly due to lacunae in managing obstetric emergencies at various levels. Looking at the health care deficiencies, there is need to improve community-level resources and most importantly, awareness regarding antenatal visits among the public. There is also need for improved quality and quantity of prenatal visits and to birth preparedness and complication readiness activities.

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