



Maternal Near Miss in a Tertiary Care Hospital

**Sanjay Kumar Patil^{1*}, Ashitosh Bahulakar¹, S. S. Vhawal¹, Guvari Rangunath¹
and Sanjay M. Jadhav¹**

¹Department Obstetrics and Gynaecology, Krishna Institute of Medical Sciences, Karad -415110, Maharashtra, India.

Authors' contributions

This work was carried out in collaboration among all authors. Author SKP designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AB and SSV managed the analyses of the study. Authors GR and SMJ managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

A hospital-based observational study was performed with 250 patients to assess the incidence of near-miss maternal related to extreme obstetric problems or maternal disease and near-miss mortality level institutional maternal. A majority of patients were from middle class (78%) followed by lower class (12%) and upper class (10%). Hypertension in pregnancy was diagnosed in 40% patients, while 12% and 6% patients had diabetes mellitus and cardiac diseases respectively. The gestational age at delivery was between 37-41 weeks in 64%, followed by 36% delivering before 37 weeks. The live birth rate was 68% while fresh still birth and macerated still birth was 22% and 10% respectively.

Keywords: Near miss; millennium development goals; sustainable development goals.

1. INTRODUCTION

The true measure of civilization attained by a society can be gauged the care it gives to its

most vulnerable members pregnant women and children. It is hence a travesty and a blot on modern society that against a backdrop of great scientific and technological advance and

development, women continue to risk death during pregnancy as they give birth to the future of humanity. Progress in maternal death reduction one of the major millennium development goals (MDGs) though significant, fell short of projected goals and was most countries had a particularly slow maternal mortality ratio. There is an urgent need to solve this global problem and are now an important measure in the recently adopted Sustainable Development Goals (SDGs) [1].

Within the MDGs, the Goal 5 was to improve maternal health. This fell short of the target with the aim of reducing maternal mortality by 75% by 2015 not having been met [2]. Since then the United Nations General Assembly has moved to commit to the SDGs, with Goal 3 addressing ensuring healthy lives and promotion well-being for all at all ages. SDG 3.1 now aims to achieve a reduction in global maternal mortality ratio to less than 70 per 100,000 live births. The present study was undertaken at our institute which is a tertiary care center providing healthcare including maternity care for a large semi urban and rural population, to determine the prevalence of maternal near miss due to severe obstetric complications or maternal disease and to determine Institutional Maternal near miss mortality ratio.

1.1 Aims and Objectives

'A purpose is the eternal condition of success.' Theodore Munger To determine maternal near miss incidence owing to serious obstetric problems or maternal disease. To determining percentage of Institutional Maternal Near Miss Mortality ratio.

1.2 Review of Literature

Maternal mortality is a sentinel occurrence intended to determine a health care system's consistency. The main measure is the ratio of maternal mortality, described as the ratio of the number of deaths per 100,000 live births. Owing to better healthcare the ratio in developing countries has been slowly diminishing. In the UK for example, the ratio was halved per 10 years in 1952-1982 [3]. The figure has now settled within the European Union at about 10 to 20 [4]. Countries need a clear description of the reasons and rates of maternal mortality. Latest longitudinal studies have found several anomalies with the assessment of maternal fatalities owing to a lack of common descriptions

and standards for maternal accidents and close misses [5,6]. A maternal near-miss case is defined as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy" [7,8].

Near-misses are more frequent than maternal mortality, they follow the same course that contributes to mortality and include details on treatment provided and potential ways of intervention, as people recover, near-miss analysis may be considered as less risky than death reports, with the monitoring staff as they can hear about the woman themselves because they can be examined themselves. For most developing nations, referral to an intensive care unit or a critical treatment criterion was used to define near-misses [9]. The disadvantage of the secriteria, though, is the simplicity and affordability of intensive care services for patients using them. Certain procedures such as intra-partum hysterectomy results, blood transfusion, or caesarean section were used to classify near misses. The advantages of this system are that it helps in establishing the pattern of the disease causing morbidity, comparisons can be made, definition can be standardized and used in many different settings, problem within the health system may be studied and audit can be carried out prospectively.

2. MATERIALS AND METHODS

A hospital-based retrospective, surgical study was performed with 250 patients to assess the incidence of near-miss maternal related to extreme obstetric problems or maternal disease and near-miss mortality level institutional maternal. The patients selected for the study were admitted to Maternity department of Krishna Institute of Medical Sciences, Karad. All the cases admitted in this tertiary care, teaching hospital that serves a large semi urban and rural population which fulfilled the inclusion criteria for near miss.

3. OBSERVATIONS AND RESULTS

As seen in Table 1, a majority (48%) of near miss cases were found in the age group of 21-25 years followed by 32% in the age group of 26-30 years. The 16% in the age group of below 20 years were significant since the obstetric risks related to this group of young women is recognized, with adolescent pregnancies being at high risk and requiring monitoring and appropriate care.

Table 1. Distribution of patients according to age

Age (yrs)	Patients	% age
≤20	40	16%
21-25	120	48%
26-30	80	32%
≥30	10	4%
Total	250	100%

As seen in Table 2, the study group was educated up-to primary level in 24%, SSC in 34%, HSC in 20% and graduation in 10%. Of the study population 12% had no education.

Table 2. Distribution of patients according to Education

Education	Patients	% age
Primary	60	24%
SSC	85	34%
HSC	50	20%
Graduation	25	10%
Uneducated	30	12%
Total	250	100%

As seen in Table 3, booking status showed that 62% patients were unbooked and 38% patients were booked cases. This was a factor significantly associated with near miss situations which were less likely in booked patients in the institution.

Table 3. Distribution of patients according to Booking Status

Booking Status	MNM Patients	% age
Un-booked	155	62%
Booked	95	38%
Total	250	100%

Table 4. Patient’s residential distance from the hospital

	MNM cases	%age	Maternal deaths	% age
Within 10 (kms)	62	25.74	2	10.17
11-30 (kms)	59	24.20	5	23.21
31-50 (kms)	36	13.62	4	17.40
>50 (kms)	93	36.44	10	49.22
Total	250	100%	21	100%

Table 5. Hospitals stay after near miss event

Hospital Stay (days)	MNM	% age
<10	20	8%
10-20	195	78%
>20	35	14%
Total	250	100%

Table 4 above shows the residence of patients and the distance of hospital for the patients based on age group. Most patients had residence that was located distant to the hospital (93%), however, 62% of the pregnant women resided within the range of 10Kms from hospital. Most cases of maternal deaths (MD) occurred in patients residing more that 50kms away (49.22%), whereas patients residing near the hospital had least cases of maternal deaths (10.17%).

As seen in Table 5, 78% patients needed hospitalization for 10-20 days while 14% and 8% patients needed hospitalization for >20 days and <10 days respectively.

4. DISCUSSION

An observational study was performed with 250 patients to assess the incidence of near-miss maternal related to extreme obstetric problems or maternal disease and near-miss mortality level institutional maternal.

Shrestha NS et al. [10] in a descriptive study on Near miss maternal morbidity and maternal mortality reported the prevalence of near miss case was 2.3%. In our study, 24% of the study group was educated up-to primary level while 34% and 20% of the patients studied till SSC and HSC respectively. 10% of the study population was graduates and 12% patients had no education. Majority of patients were from middle class (78%) followed by lower class (12%) and upper class (10%). Booking status showed that 62% patients were un-booked and 38% patients were booked cases.

Table 6. Obstetric complication frequency percentage

Condition	Occurrence	% age
Eclampsia	38	10%
Severe pre-eclampsia (HELLP)	80	52%
Sepsis	29	7%
Ruptured uterus	20	3%
Severe PPH	49	10%
Organs dysfunction		
Respiratory dysfunction	36	6%
Hematological dysfunction	35	8%
Renal dysfunction	52	9%
Uterine dysfunction	16	3%
CVS dysfunction	62	15%
Hepatic dysfunction	42	14%
Neurologic dysfunction	31	7%

The most common cause of the NMN trigger was extreme Pre-eclampsia (52%) and eclampsia with 10 percent. Hemorrhage in postpartum was 10%, while 7% sepsis and 3% uterus rupturing. Among most common affected organs were Heart and liver

Mustafa R et al. [11] in a cross-sectional, observational study reported that 90.4% of near miss cases were un-booked and all deaths occurred in the un-booked cases. Majority of patients in our study were multigravida (56%) while Primigravida patients constituted 44% of the study group. Additionally, Mustafa R et al. [11] reported majority of Near Miss cases happened with caesarean delivery (53.1%).

Chandran JR et al. [12] in a retrospective observational study found in demographic characteristics majority of the patients were between the age of 20-34 years (48.6%), were Multigravidas (55.4%) and had preterm delivery (63.2%). It was observed in the present study that 40% patients had hypertension while 12% and 6% patients had diabetes mellitus and cardiac diseases respectively. 64% patients were between 37-41 weeks of gestational age at delivery followed by 36% patients in <37 weeks.

Chandran JR et al. [12] in a retrospective observational study also reported Vaginal 115 43.07%, C- section 142 53.1%, and Instrumental delivery 10 3.7%. In a retrospective observational study on Maternal near miss review reported cause of maternal mortality was hypertensive disorders of pregnancy (25%) followed by haemorrhage and sepsis 17% each.

Amniotic fluid embolism comprised 12% followed by anemia and heart disease 8% each. Other causes comprised 10%. Among the hypertensive disorders severe pre-eclampsia comprised 23.5%, eclampsia 14.9%, HELLP syndrome 7.1%. Among the spectrum of haemorrhage,

postpartum haemorrhage comprised maximum (13.1%) cases of near misses.

5. CONCLUSION

Near to miss cases share certain similarities of maternal accidents, because they were precursors to a tragedy. Studying near misses will provide useful insight into the standard of obstetric care and an identification of obstacles and shortfalls that may have predisposed to or resulted in acute life threatening complication. This information provides the potential for institutional improvement and proactive steps to be taken to prevent pregnancy-related death and the long-term morbidity in the established issues. Based on our results, we propose a range of steps that will hopefully reduce potential maternal deaths. These are practical, applicable in both the public as well as private sector service delivery and would result in mortality reduction in the short and medium term. Near misses can be prevented to some extent by spreading awareness about possible obstetric complications and risk stratification by primary care givers. Instituting and enhancing the delivery of antenatal services to better detect high-risk pregnancy like preeclampsia early on. Developing and implementing protocols for the prevention and management of postpartum haemorrhage, including raising awareness and adherence to the third stage use of active management. Training obstetric health practitioners to treat rare yet lethal illnesses, such as sepsis. Ensuring the availability of emergency obstetric care and defining a referral and transport system to move critically ill women

to higher centers for advanced care. After first line therapy, prompt referral will play crucial role in risk mitigation and prevention. Establishment of a network of Obstetric Critical Care Units with a multi specialty team approach to care. The provision of blood bank facilities and ventilator assistance in first referral units should be compulsory and a coordinated multi specialty critical care team care should be available in tertiary hospitals. Adequate training for obstetricians in managing obstetric emergencies, quality nursing care and psychological support is also an important need of the hour.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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