

Original Research Article

## **Menace of Maternal Near Miss: An Institutional Experience from South India**

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**Abstract:** To determine the frequency of maternal near miss, MNM incidence ratio in our institution, (2) To analyze the nature of near miss events and reinforce protocols for interventions and management of severe acute maternal morbid conditions. This is a prospective audit of antenatal and delivery data registry in Department of Obstetrics in a tertiary care teaching hospital in South India. All near miss cases as defined by WHO 2009 criteria with main outcome measure of severe acute maternal morbidity. There were 1400 deliveries. Out of which 104 are potentially life threatening cases and 16 are life threatening cases during the study period. The Maternal near miss incidence ratio was 11.4/1000 live births. Hemorrhage was the leading cause (3.21%), followed by hypertensive disorders (3.07%) and thrombotic complications (0.35%). Hemorrhage and hypertensive disorders were the leading causes of near miss events. As near miss analysis indicates the quality of health care, it works as a complement for maternal mortality and also to evaluate the quality of obstetric care in that particular institution.

**Keywords:** Near miss; Hemorrhage; Hypertension; mortality; delivery.

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### **INTRODUCTION**

Millennium development goal 5 (MDG) for 2015, was 'To improve maternal health' and reduce maternal mortality by 75% [1]. Maternal mortality is "Just the tip of iceberg" with a vast base to the iceberg which constitutes maternal morbidity. Despite therapeutic advances during this century and growing perception of safety of childbirth morbidity and mortality can occur in obstetric practice. More than one woman dies every ten minutes. Beyond every woman who dies, there are many women who suffered serious life-threatening complications of pregnancy and nearly died. Maternal morbidity was more than 300 million in developing countries; yet little attention is given to maternal morbidity. Pregnant women's health status is not reflected by mortality indicators alone. Hence the concept of severe acute maternal morbidity (SAMM) is apt for the present health providing system [2, 3].

SAMM has been studied extensively in the recent past as a complement for maternal mortality and also to evaluate the quality of obstetric care in that particular institution. This concept is superior over

maternal death in drawing attention to surviving women's reproductive health and lives and is equally applicable in developing countries as well as developed countries. Prevention of maternal mortality is the aim of obstetricians; hence an outcome audit of severe acute maternal morbidity (SAMM) is used as an adjunct to an assessment of maternal deaths and concentrates on management of morbidity [4].

The ultimate purpose of the near-miss approach is to improve clinical practice and reduce preventable morbidity and mortality through the use of best evidence-based practices [5]. 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" [6]. Till recently there were no set criteria for identification of these cases for routine implementation, and wider application of this concept was limited. But in 2009, WHO has come up with clinical, laboratory, and management criteria for the identification of these cases [6].

**MATERIALS AND METHODS:**

This is a prospective audit of antenatal and delivery data registry in Department of Obstetrics in a tertiary care teaching hospital in South India. An audit of maternal near miss cases from July 2013 to August 2014 (14 months) was undertaken. Ours is a rural referral center. In addition to providing twenty-four-hour emergency obstetric services, the hospital also provides antenatal care and delivery services for both low and high risk pregnant women. Hospital has 24-hour facility for blood component therapy. High dependency unit (HDU) in labor room complex and intensive care ICU with 24-hour facility for multidisciplinary specialty also function well.

Potentially life threatening conditions were diagnosed, and those cases which met WHO 2009 criteria for near miss were selected. WHO criteria included a set of clinical, laboratory, and management-based criteria. Maternal mortality during the same period was also analyzed. Patient characteristics including age, parity, gestational age at admission,

booked [7] (more than three antenatal visits to our hospital irrespective of the gestational age), mode of delivery, ICU admission, duration of ICU stay, total hospital duration, and surgical intervention to save the life of mother were considered. Patients were categorized by final diagnosis with respect to hemorrhage, hypertension, sepsis, and other medical disorders were considered as indirect causes contributing to maternal near miss and deaths. Statistical analysis of descriptive data and frequency distribution were calculated using Microsoft Excel 2013 data sheets.

**RESULTS**

- Total number of deliveries – 1400
- Vaginal deliveries – 840 (60%)
- Caesarean deliveries – 560 (40%)

Table 1 displays the various morbid events constituting Maternal near miss proportions.

**Table-1: Maternal near miss – Morbidity events**

DIAGNOSIS	MATERNAL NEAR MISS (n=104)	PERCENTAGE
<b>Hypertensive disorders of pregnancy</b>	43	(3.07%)
• Severe preeclampsia	30	(2.14%)
• Eclampsia	12	(0.85%)
• HELLP syndrome	1	(0.07%)
<b>Severe haemorrhage</b>	45	(3.21%)
• Early pregnancy		
Ectopic pregnancy	6	(0.4%)
Abortion		
• Late pregnancy		
Abruptio	10	(0.7%)
PPH	27	(1.9%)
Placenta Previa / Accreta		
Ruptured Uterus	2	(0.14%)
<b>Sepsis</b>	-	
<b>Acute respiratory failure</b>	2	(0.14%)
<b>Cardiac</b>	4	(0.2%)
<b>Hematomas</b>	5	(0.35%)
<b>Thrombosis</b>	5	(0.35%)

The mean maternal age was 24 ± 4.5 years (16 – 36). The parity ratio of primipara to multipara was 33: 10. The frequency distribution of gestational age in weeks for 1 – 12; 13 – 28; 28 – term; post-natal was 6, 2, 80, 16 respectively. In all 24 cases required life saving surgical interventions. Table 2 shows the

spectrum and magnitude of surgical interventions performed.

Finally Table 3 summarises the indices of near miss in our data analysis which puts it at a high of 11.4/ 1000 live births.

**Table-2: Surgical interventions performed**

SURGICAL INTERVENTIONS	CASES
PERIPARTUM HYSTERECTOMIES	2
LAPAROTOMIES	22
• Rupture uterus	2
• B lynch application	10
• Stepwise devascularisation	3
• Ruptured ectopic	6
• Haematoma	1

**Table-3: Indicators of MATERNAL NEAR MISS**

INDICES	RESULTS
TOTAL BIRTHS	1400
POTENTIALLY LIFE THREATENING	88
LIFE THREATENING	16
MATERNAL NEAR MISS INCIDENCE RATIO	11.4/1000 live births

**DISCUSSION**

Obstetric deaths represent the quality of maternal care. But for the present scenario it may not reflect the global situation with regard to obstetric care. Maternal mortality is still among the worst performing health indicators in resource-poor settings.

Women who survive life-threatening conditions arising from complications related to pregnancy and childbirth have many common aspects with those who die of such complications. This similarity led to the development of the near-miss concept in maternal health. Exploring the similarities, the differences and the relationship between women who died and those who survived life-threatening conditions provide a more complete assessment of quality in maternal health care [7].

WHO criteria, 2009 are unique in considering not only clinical but also laboratory and management-based criteria. Hence it incorporates both Mantel’s [8] and Waterston’s criteria [9]. So if one of the criteria fails to pick the case, the other makes it up, thus minimizing the chance of missing the case.

The maternal near miss incidence ratio (MNMR) was 11.4/1000 live births in our hospital. Studies done in the developing countries show the similar trend and vary from anywhere between 15–40/1000 live births. Developed and western world countries have better index with single digit proportions. Table 4 displays comparison between studies from various countries around the World [10-15]. Though the national average of India is around 3.3 %, ours was higher probably reflecting the referral patterns and peripheral rural location of our institute.

**Table-4: Comparison of various International statistics on maternal near miss**

COUNTRIES	STUDY SETTING	CRITERIA	MATERNAL NEAR MISS INCIDENCE(%)	CAUSES OF NEAR MISS (%)
NIGERIA	Oladapo 2005 Teaching hospital	Disease specific and management based	14.1 %	Hemorrhage (30.2)
AFRICA	Filipi 2005 Hospitals at different levels	Disease specific	8.23 %	Hemorrhage (22.7-52.8)
UK	Waterstone 2001	Disease specific	1.2%	Hemorrhage (0.67)
FRANCE	Population based random selected cases	Disease specific	0.8%	Hemorrhage (49.7)
<b>INDIA</b>	<b>Chhabra 2008 Teaching hospital</b>	<b>Disease specific and management based</b>	<b>3.3% (17/10000 live births)</b>	<b>Hemorrhage (34)</b>
BRAZIL	27 maternity hospital	Disease specific	0.44%	Hypertensive (45)
PAKISTAN	Siddiqui Civil hospital	Disease specific	8.6%	Hemorrhage (33)
<b>DR.PSIMS &amp; RF</b>	<b>Rural referral center</b>	<b>Disease specific</b>	<b>11.4% (11/1000 Live births)</b>	<b>Hemorrhage (43.2)</b>

Access to good quality EmOC is another key strategy to improve maternal outcome. Studies have shown the availability and access of EmOC to be below the target coverage levels especially among the poor and less educated women in poorly performing states [16, 17]. The state of Tamil Nadu has been successful in observing a significant decline in maternal mortality due to series of initiatives such as skilled birth attendance for all births and making EmOC more available and accessible. The key lesson learnt from the success is to focus on specific evidence based strategies to reduce maternal mortality [18].

## CONCLUSIONS

Maternal near miss has emerged as an adjunct to investigation of maternal death. As the number of maternal near-miss cases is more than the maternal deaths and the cases are alive to directly inform on problems and obstacles that had to be overcome during the process of health-care, they provide useful information on quality of health-care at all levels. Thus, there is a need for application of the maternal near-miss concept for assessment of maternal health and quality of maternal care.

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