

## The Incidence And Associated Factors of Obstetric Near Miss in A Referral Institution in Manipur

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### ABSTRACT

**Background:** The World Health Organization (WHO) estimated that, in the year 2000, 20 million women suffered acute complications in pregnancy with the occurrence of 529,000 maternal deaths. Nevertheless, in a systematic review using disease-specific criteria, near miss rates have been reported to be between 0.6% and 14.98%.

**Aims and objective:** The purpose of this study was to document the frequency and causes of near miss and maternal deaths and to analyse the trend of near miss events.

**Methodology:** Cross sectional study in a tertiary referral hospital between november 2014 – november 2015. Near miss cases were defined according to WHO criteria 2009.

**Result :** There were 5553 live births, 22 near misses and 5 maternal deaths. The obstetric near miss outcome ratio was 3.96 cases/1000 live births, the maternal near miss : mortality ratio was 4.4 : 1.

**Conclusion:** Post-partum Haemorrhage along with hypertension are the major causes of obstetric near miss cases. Also delay in referral and delay diagnosis are seen to aggravate the incidence of “near miss”.

**Keyword :** near-miss, maternal mortality, haemorrhage, septicemia, live-birth

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### I. Introduction

There is a growing interest in Obstetric near miss as it is seen to provide more useful information on the factors that lead to severe morbidity and death. Complications relating to pregnancy and delivery accounts for about 529000 women deaths of which 99% is accounted in developing countries. Maternal morbidity is the health indicator which shows the greatest gap between developed countries and developing countries. Whereas there are 9 maternal deaths per 100000 live births in developed countries; the developing countries stands at a contrasting figure of 450 maternal deaths per 100000 live births. The Fifth Millennium Development Goal (MDG) is to improve maternal health as in – reducing MMR by the quarters between 1990 and 2015 and to achieving universal access to reproductive health by 2015. Since 1990, maternal mortality have dropped by 47% world-wide; it is still high in developing countries. India has MMR of 212/100000 live-births in 2007 -2009 though it has declined from 398/100000 live-births in 1997- 1998. Near miss event is defined as the condition when a women who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy. The prevalence of maternal near miss varies among different countries based on health care quality and availability. However it was reported that with systemic analysis using specific criteria the prevalence of near miss have been reported to be between 0.6% to 14.98%. The prevalence of near miss is higher in developing countries though the causes are similar to those of maternal mortality namely haemorrhage, hypertensive disorders, sepsis and obstructed labour. The analysis of maternal near miss enable planning and development of safer environment and may represent a practical alternative to surveillance of maternal morbidity and mortality. This study will help to address the quality of maternal health care services.

### II. Material And Methods

This is a cross-sectional study conducted in the department of obstetrics and gynecology of JN Institute of Medical Sciences, Imphal which is one of the two medical institute in the state of Manipur and also a well known referral hospital. The study was conducted from November 2014 till November 2015; a period of 12 months. All the pregnant women admitted in the ante-natal ward of Obstetrics and Gynecology department of the hospital were included in the study. This included those who receive ante-natal care at the hospital as well those referred from other hospitals, clinics and health centres across the state. Identification of the cases was done according to WHO criteria 2009.

**Table 1.** The proposed WHO near-miss criteria

<i>Clinical criteria</i>	
Acute cyanosis	Loss of consciousness lasting >12 hours
Gasping	Loss of consciousness and absence of pulse/heart beat
Respiratory rate > 40 or <6/min	stroke
Shock	Uncontrolled fit/total paralysis
Oliguria	Jaundice in the presence of pre-eclampsia
Clotting failure	
<i>Laboratory-based criteria</i>	
Oxygen sats < 50% for >60 mins	Ph <7.1
PaO <sub>2</sub> /FiO <sub>2</sub> < 200mmHg	Lactate > 5
Creatinine > 300µmol/l or >3.5mg/dl	Acute thrombocytopenia (< 50000 platelets)
Bilirubin > 100µmol/l or > 6.0 mg/dl	Loss of consciousness and the presence of glucose and ketoacids in urine
<i>Management-based criteria</i>	
Use of continuous vasoactive drugs	Intubation and ventilation for > 60 mins not related to anesthesia
Hysterectomy following infection or haemorrhage	Dialysis for acute renal failure
Transfusion > 5 U of red cell transfusion	Requiring CPR

The data were collected applying the above criteria for definition of near – miss cases and maternal death was defined as the death of women while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of the pregnancy from any cause. Data were entered and calculation were done using software SPSS version 16.0. students’ t-test and x<sup>2</sup> test were also used to compare mean and proportions and p value of <0.05 was considered significant.

### III. Result

In this 12 months period of study there were 5553 live births, 22 near miss cases and 5 maternal deaths. This resulted in obstetric near miss outcome ratio of 3.96/1000 live- birth and near miss : maternal mortality ratio of 4.4 : 1.

**Table 2.** Identified near miss (NM) events

Near miss events		Number (n=22)	Percentage (%)
Haemorrhage	PPH	7	31.81
	APH	2	9.09
Hypertensive disorders	Pre-eclampsia	2	9.09
	Eclampsia	3	13.63
Anaemia		1	4.54
Septicemia		2	9.09
Ruptured uterus		2	9.09
Cardiovascular disorder – eisenmenger syndrome		1	4.54
Medical complication – DIC		2	9.09

In our study haemorrhage accounts for most of the near miss cases (40.90%) of which PPH was 31.81 and APH was 9.09% . Hypertensive disorders also have a major role in causing near-miss events. The other causes of near-misses were septicemia (9.09%), ruptured uterus (9.09%) , medical complications (9.09%), while anaemia and cardiovascular disorder i.e eisenmenger syndrome contributed 1 cases each (4.54%).

**Table 3.** Causes of maternal mortality(MM)

Factor	Maternal mortality n=5	Percentage (%)
Haemorrhage (PPH)	3	60
Septicemia	1	20
Ruptured uterus	1	20
Embolism	0	0
Anemia	0	0

PPH was found to be the main cause of maternal death i.e 60% while septicemia and ruptured uterus also scored a case each of maternal mortality (n=5).

**Table 4.** Socio-demographic profile showing distribution of near-miss and maternal mortality

Variable		Near miss	Maternal mortality
Age (yrs)	20 - 25	2	0
	26 - 30	5	1
	31 - 35	7	2
	36 - 45	8	2
Parity	P <sub>0</sub>	2	0
	P <sub>1</sub> - P <sub>2</sub>	7	1
	P <sub>3</sub> - P <sub>4</sub>	10	4
	>P <sub>5</sub>	3	0
Previous abortion		2	0
Rural residence		15	4
Illiteracy		2	0
No ANC		4	2
Referred cases		8	3

While we saw an increasing number of near-misses with age; maternal mortality doesn't show such a trend. More cases of near-miss in 31-35 and 36-45 age groups were attributed to haemorrhage. Near-miss events were also seen to be more in P<sub>3</sub>-P<sub>4</sub> parity contributing 45.45% of it. 31.85% of NM was seen in P<sub>1</sub>- P<sub>2</sub> parity and fewer cases were seen in P<sub>0</sub> and >P<sub>5</sub>. Meanwhile 80% of maternal deaths were found in parity group of P<sub>3</sub>-P<sub>4</sub> which further could be largely attributed to PPH. Majority of the NM and MM patients were from rural areas though 90.01% and 100% of the respective cases were literate. Most of the patients did went for ANC except 1.81% of NM and 20% of MM events. 9.09% of NM cases gave history of previous abortion. 8 cases of the 22 NM patients and 3 of the 5 MM cases were found to have been referred to this institute from PHC's , PHSC's and other private clinics all over this state of Manipur.

#### IV. Discussion

Maternal near miss ratio which is the ratio of the number of maternal near-miss cases and live births is used to evaluate quality of care. Another important indicator is maternal near miss mortality ratio of maternal near miss and deaths. The higher ratio indicates better care. The ratio was observed to be lower in asia and africa compared to higher countries<sup>7</sup>. 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. Hence new near-miss criteria may take over the maternal mortality ratio. WHO criteria incorporates both Mendel's and Waterson's criteria<sup>8</sup>. Maternal near-miss ratio (MNMR) which reflect the overall standard of obstetric care is 32.9/1000 livebirths(LB) in Damascus and 12.3-82.3/1000 LB in other developing countries. While in our study it was found to be 3.96/1000LB. The near-miss : maternal death ratio(NM:MM) varied largely across different studies around the world ranging from 19:1 in Greece, 11:1 in London, 19:1 in France, 28:1 in Bolivia and 62:1 in Brazil<sup>9</sup>. Most of the variation in the ratio was described due to difference in diagnostic criteria and sample size<sup>10</sup>. In developed countries the major causes of near-miss were pre-eclampsia, PPH and sepsis. However in developing countries the incidence of near-miss is 3 times more than the developed country with haemorrhage being the most common cause. Our present study also attributed haemorrhage(40.90%) to be the most common cause with PPH(31.81%) being the major contributor. Hypertensive disorders(13.63%) was the next major causes of near-miss events. Septicemia, ruptured uterus and medical complication also anemia and cardiovascular disorders accounted for near-miss cases in our study. A study in western Rajasthan, India showed the causes of near-miss as- haemorrhage 56% (28.5% PPH, 28% APH), hypertension 17.8%, infections 5.35%, ruptured uterus 8.92% and medical complications 11.6%. Another study in India by Tally et al. in 2004 showed similar findings with 60% of near-miss was accounted to haemorrhage and 34% to hypertension. A group of researchers in Kathmandu also recorded haemorrhage to have contributed 41.66% of near-miss and hypertension 21.77%<sup>11</sup>. 93% of near-miss events were brought to the hospital in critical condition after being referred from other hospitals, private practices or homes. Transportation of patients to hospital was seen to be a strong barrier as another study in Syria, about maternal deaths where deliveries took place at home, 31% was on the way to hospital<sup>12</sup>. There were 5 maternal deaths in our study of which PPH was the main cause. The prevalence of maternal deaths doesn't show much changes despite the change in health care delivery. MMR in Lao PDR was recorded to be 179/100000 live births. However the state of Tamil Nadu in India scripted a significant decline in maternal mortality. They observed that initiatives such as skilled birth attendance for all births and EmOC (Emergency Obstetrics Care) availability plays an important role in the achievement<sup>13</sup>. In India the promotion of Janani Suraksha Yojana(JSY) which is a cash incentive scheme aimed to promote Institutional deliveries served its purpose with the number rising from 25.4% institutional deliveries in 2001 to 38.8% in 2006; 47% in 2007 – 2008 and 72.9% in 2009. This increase in load on the health facilities certainly has led to either increase incidence of haemorrhages, hypertensive disorders and no decline in the number of maternal deaths. The proportion of physical consequences(serious illness) and risk of depression were higher among near miss cases then uncomplicated deliveries. A near miss event had consequences that go beyond the first days after delivery as economic burden is closely linked to the households. However a limitation of our study was that data collection was done only in wards. Many women who were in maternal morbidity category in this state of manipur may not have reached the hospital. Also our study did not represent the status in private sector.

## V. Conclusion

The major cause of near miss were similar to the causes of maternal mortality in India. Decreasing in the number of near-misses may help reduced near –miss.

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