

MATERNAL NEAR MISS: AN EXPERIENCE IN RURAL MEDICAL COLLEGEMadhavi Nacharaju¹, Sunita Sudhir P², Rajesh Kaul³, Preethi Reddy⁴**HOW TO CITE THIS ARTICLE:**

Madhavi Nacharaju, Sunita Sudhir P, Rajesh Kaul, Preethi Reddy. "Maternal Near Miss: An Experience in Rural Medical College". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 56, October 27; Page: 12761-12767, DOI: 10.14260/jemds/2014/3693

ABSTRACT: INTRODUCTION: Maternal mortality is an important indicator of health care system. As the mortality rates are consistently decreasing the focus is shifted on maternal near miss which describes severe maternal morbidity which shares the common pathway as mortality. Maternal near miss indicators are relevant in developing world and low resource setting as it indicates the gaps in the health system. In 2009 WHO working group has standardized the criteria for selecting these cases. **MATERIAL AND METHODS:** This study is performed in rural medical college between October 2012 to september 2014 and maternal near miss cases are identified according to WHO criteria. Variables related to age, parity, gestational age, intensive care unit admission, ventilator support, requirement of massive blood transfusion were analyzed. Further the events leading to maternal near miss were studied. Finally the indices like maternal near miss incidence ratio, maternal near miss: maternal mortality ratio and mortality index were calculated. **RESULTS:** during the study period 2409 deliveries were conducted of which 2385 were live births. Potentially life threatening conditions were identified to be 265 and maternal near miss cases were 22. Maternal near miss incidence ratio was 9.2 per 1000 live births, maternal near miss to maternal mortality ratio was 11:1 and mortality index was 8.3%. The leading causes of maternal near miss were abruption and rupture uterus requiring emergency hysterectomy. The morbidity was high in unbooked cases. **CONCLUSION:** maternal near miss is good alternative indicator of health care system. Lacunae between grass root level and tertiary centers should be filled.

KEYWORDS: Maternal near miss, unbooked, mortality index, preeclampsia.

INTRODUCTION: Maternal mortality is an important indicator of efficiency of health care system. Maternal mortality ratio is defined as number of maternal deaths per 100000 live births. Over the years the ratio consistently declined in developed countries^{[1][2]} as low as the mortality number being in single digits.^[3] The fifth millennium development goal is to reduce maternal mortality by three quarters by 2015 and to achieve access to reproductive health facilities to all women.^[4]

The low mortality figures could not evaluate the severe maternal morbidity prevailing in the system. In fact maternal deaths represent very few numbers of maternal disabilities. The survivors of the severe event probably suffering lifelong disabilities are more in number than the actual death rate. This has stimulated the researchers to investigate into the details of survivors of severe acute morbidity.

Severe acute maternal morbidity (SAMM) has now been accepted as a measure of health care system.^[5,6] Extensive research has been done to standardize SAMM as a measure of efficiency of health care system to replace maternal mortality indicators. until recently there were no specific guide lines to assess the severity of maternal condition.^[7] In 2009 WHO working group recommended three different approaches of selection criteria for identification of severe morbidity based on disease

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specific, management based and organ dysfunction to identify severe morbidity and the concept of Maternal Near Miss (MNM) evolved.^[8]

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”.^[8] Maternal mortality rate in Indian scenario has been significantly reduced from 254(SRS 2004-06) to 212(SRS 2007-09).^[9] Yet there is a scope for analyzing maternal near miss cases in developing countries like India which will help us understand health system failures in obstetric care and thus executing necessary action.^[9]

They also help us to provide information about the common pathways which led to maternal death; care received, and also suggests means of prevention. This study has been performed with an aim of assessing the number of MNM cases, MNM incidence ratio, MNM to mortality ratio, and mortality index. Further the details of MNM cases are also analyzed

MATERIAL AND METHODS: The study has been conducted in rural medical college and the cases from October 2012 to September 2014 were analyzed. We are equipped with facilities for 24hour obstetric care as well multidisciplinary care. The catchment area includes rural population from surrounding villages. Unbooked cases are referred to us in severe morbid conditions.

The cases with potentially life threatening conditions are identified and those meeting the WHO criteria for maternal near miss are selected. Various variables pertaining to the patients like age, parity, gestational age, booked status, mode of delivery, Intensive care unit admission, and duration of hospital stay were analyzed. Further the immediate causes of MNM were considered.

The analysis also included the calculation of indices:

1. MNM incidence ratio: number of MNM cases per 1000 live births.
2. Maternal near miss to mortality ratio: higher ratio suggests better health care system.
3. Mortality index: Number of maternal deaths divided by the number of women with life threatening conditions, expressed as a percentage. Quality of care is represented by low index.
 $MI = MD / (MNM + MD) \times 100.$

RESULTS: During the study period 2409 deliveries were conducted, of these 2385 were live births. Potentially life threatening conditions were identified as 265 and MNM cases were 22. Maternal deaths were 2. (Fig 1) Severe preeclampsia and related conditions (eclampsia, abruption, HELLP syndrome) predominated the list of potentially life threatening conditions accounting to 81.1% followed by ectopic pregnancy (9.4%).(Table 1)

All the patients with MNM were less than 30years and 72% were less than 25 years. Primigravidae accounted to 36% of MNM cases. Seventy seven percent of cases were in third trimester. Nearly 82% of the MNM cases were referred to us in severe morbid condition. Sixty three percent of them required caesarean delivery. Fifty percent of the cases were admitted to intensive care unit of which 27% required ventilator support for non anaesthetic indication.

Massive blood transfusion was required in 45% of the cases. Patients were hospitalized for longer time as 72% of them stayed in the hospital for more than 10 days. (Table 2) Table 3 shows the near miss events of which abruption placentae had severe morbid course with two requiring ventilator support, massive blood transfusion and transfusion of blood products.

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This was followed by rupture uterus requiring caesarean hysterectomy. Ventilator support and massive blood transfusion were part of the management for these cases. Indirect causes of MNM accounted to 27%. Maternal death occurred in two patients; both were referrals from private sector sent in severe morbid condition. The first case was referred one day after caesarean section with circulatory failure and endotracheal tube in situ.

She succumbed with 6 hours of admission. Death was consequence of severe sepsis. The second case too was unbooked case, post caesarean, with severe post-partum haemorrhage. She died within 4 hours of admission. Maternal near miss incidence ratio was 9.2 per 1000 live births. The calculated MNM to mortality ratio is 11: 1. The mortality index in our study is 8.3%.

DISCUSSION: Maternal mortality rate was an important indicator of the health care system. As the rate declined in developed countries maternal near miss was considered and guidelines to select a patient under this category were given by WHO working group.^[7] In due course assessment of health care facilities by maternal near miss was found to be equally effective.^[10] Since then focus was shifted from maternal mortality to maternal near miss. Pacagnella RC, Cecatti JG et al^[11] found the incidence of potentially life threatening maternal conditions to be 11.6%.

This was correlating with our study result which was found to be 11.1%. A similar study done by Roopa PS, Shailja Verma et al ^[12] found 10.3% incidence of potentially life threatening maternal condition. Maternal near miss incidence ratio has been 9.2 per1000 live births. A study by Jayarathnam et al ^[13] documented a ratio of 6 per 1000 live births; While Roopa PS et al^[12] could record a ratio of 17.8. The author quoted that they receive significant number of referred cases from nearby districts.

A large systematic review in sub Saharan Africa found the MNM incidence ratio ranging from 10.1 to 37.4.^[14] There was high incidence of MNM cases in Nigerian study^[15] recorded upto140 per 1000 live births. There were varying reports from the developing world. A study conducted at Damascus reported MNMR as 32.9 ^[16]. The prevalence if MNM cases at Kathmandu medical college was 2.3%.^[17]

The calculated MNM to mortality ratio was 11:1 which means for every one maternal death there would be 11 cases of maternal near miss. A ratio of 5.6:1 was recorded by Roopa et al.^[12] Systematic review in Africa recorded this ratio as 1.1: 10.1 to 3.1: 37.4.^[14] The Nigerian study documented 4.8:1.^[15] It was 4.7:1 in a study by Mantel, G.D., et al.^[18] The mortality index in our study was 8.3% as against 14.9% by Roopa PS et al. A study at Nigeria ^[15] recorded 17.2% of mortality index while it was as low as 1.63% in Damascus.^[16]

The causes of maternal near miss were mostly due to preeclampsia and its related conditions accounting to 31%. It was followed by atonic post-partum haemorrhage and abruption 13.6% each. Ectopic pregnancy was the cause in 9% of cases. The study at Nigeria also substantiated the finding as hypertension and haemorrhage together accounted for 61%.^[15] On the contrary a pilot study by Mantel et al^[18] found emergency hysterectomy was the leading cause of maternal near miss. Haemorrhage was the leading cause accounting to 41.66% in the study done by Shrestha, N.S.et al.^[17]

There were direct and indirect causes of MNM with 77% and 23% respectively. Jayarathnam et al^[13] attributed 64% to obstetric causes and 36% to non-obstetric causes. It is learnt from our study that a significant number of cases are being referred in severe morbid condition and integrated approach is required in treating those cases.

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The hospital should be equipped with intensive care unit, blood bank facilities, and team approach by various specialties, which we have extended to the near miss cases and could bring down the mortality rate. Further the referral system should be well connected from the grass route level to tertiary care center. More over the health care workers at the grass route level should be trained to identify high risk pregnancies before they are potentially life threatening and refer them in stable condition so that we minimize the near miss cases.

CONCLUSION: Maternal near miss is an important indicator of health care system. Preeclampsia is the leading cause of MNM followed by abruption and post-partum haemorrhage. Health care workers are to be trained to identify the risk factors and refer the cases well before they are potentially life threatening. The primary care Centres are to be well connected to the tertiary referral centres especially in rural areas.

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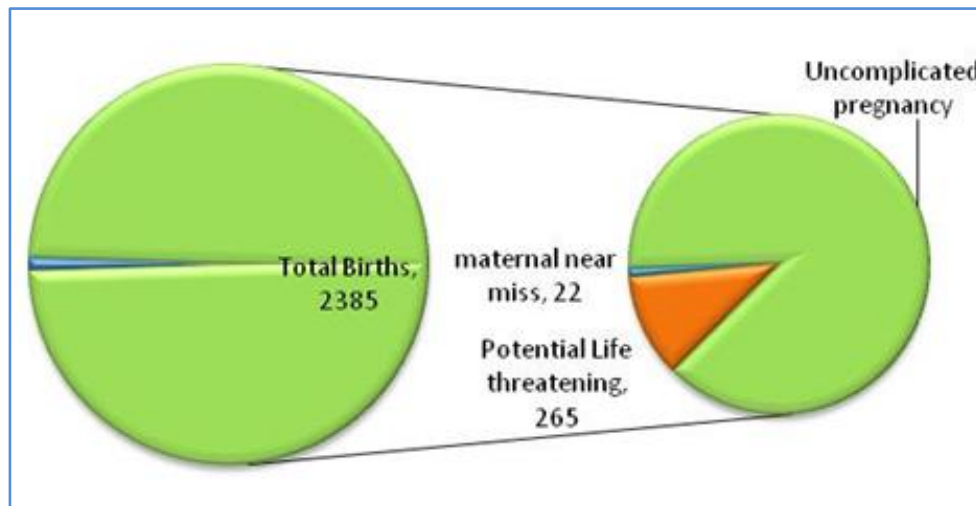


Fig. 1: Maternal near miss cases per total live births

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Severe preeclampsia	149 (56.2%)
Eclampsia	48 (18.1%)
Ectopic pregnancy	25 (9.4%)
Abruption placentae	15 (5.6%)
Post-partum haemorrhage	10 (3.7%)
Rupture uterus	7 (2.6%)
Abortion with severe haemorrhage	5 (1.8%)
Placenta accrete	3 (1.1%)
HELLP syndrome	3 (1.1%)
Total	265

Table 1: Potentially life threatening conditions

Age of the patient	
20-25years	16 (72.7%)
25-30	06 (27.2%)
Parity	
Primipara	08 (36.3%)
Multipara	14 (63.6%)
Gestational age	
1-12weeks	2 (9.1%)
13-28 weeks	1 (4.5%)
>28 weeks	17 (77.2%)
Post-partum	2 (9.1%)
Booked cases	04 (18.1%)
Unbooked cases	18(81.8%)
Mode of delivery	
Vaginal delivery	08 (36.3%)
Caesarean section	14 (63.6%)
Intensive care unit admission	11 (50%)
Ventilator support for non anaesthetic indication	6 (27.2%)
Massive blood transfusion (more than 5 units)	10 (45.4%)
Duration of hospital stay	
5-10 days	06 (27.2%)
10-15 days	14 (63.6%)
15-20days	02 (9%)

Table 2: Variables of patients with near miss events

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Direct causes	
Atonic PPH with massive transfusion (>5units)	3 (13.6%)
Abruption	3 (13.6%)
Preeclampsia with Jaundice (>6mg/dl)	3 (13.6%)
Rupture uterus with caesarean hysterectomy	3 (13.6%)
Ectopic pregnancy	2 (9.1%)
Placenta praevia with Morbidly adherent placenta with caesarean hysterectomy	1 (4.5%)
Severe preeclampsia with Cerebral venous thrombosis	1 (4.5%)
Mitral stenosis with atrial fibrillation	1 (4.5%)
Indirect causes	
Dengue fever with Thrombocytopenia (platelets less than 50000)	2 (9.1%)
Chronic liver disease complicating pregnancy	1 (4.5%)
Subdural haematoma	1 (4.5%)
Haemolytic anaemia	1 (4.5%)
Total	22

Table 3: Events leading to maternal near miss

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