



MATERNAL NEAR MISS – AN OVERVIEW OF SURVIVAL IN A TERTIARY CARE CENTER

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ABSTRACT

Background: Maternal health acts as an indicator for quality of healthcare services provided by healthcare system. Maternal mortality has always been a subject of intense discussion as it has a pivotal role in policy making for better health care delivery system and its implementation. Getting accurate indicators for maternal mortality is difficult hence WHO came up with criteria based on parameters of organ dysfunction and management termed as 'maternal near miss'. It is defined as pregnant or recently delivered woman who survived a complication during pregnancy, childbirth or 42 days after termination of pregnancy. **Methods:** This is a prospective observational study conducted over 12 months in a tertiary care center that included all the cases of maternal near-miss managed successfully. **Results:** During these 12 months, we had 68 cases of maternal near miss with major contributors were obstetrical hemorrhage (60.29%), hypertensive disorders of pregnancy (51.47%), severe anemia (54.41%). Most involved organ system was hematological system. The maternal near miss incidence ratio was 6.8 /1000 lives births. **Conclusion:** As causes for maternal near miss and maternal mortality are similar, an attempt to provide multidisciplinary approach emergency obstetric care can save many lives. Auditing of near miss cases can help in formulating measures to tackle morbid obstetric cases.

KEYWORDS: Maternal health, maternal near miss, maternal near miss incidence ratio.

INTRODUCTION

Maternal health and well-being are of immense importance when it comes to shaping the society. A healthy mother can provide for her family in a better way. Improvement of maternal health is one of the millennium development goals, MDG 5 with target 5 A that calls for reduction of maternal mortality ratio by three quarters between 1990 and 2015.^[1] The global maternal mortality ratio is 210/100,000 births while it is about 240 in developing countries as compared to 14/100,000 in developed countries.^[2] With, childbirth doesn't always follow the safe path. This unpredictability keeps the obstetrician on their toes all the time. Mothers can sometimes land into life threatening complications during the period of pregnancy, labor and puerperium.

To identify such women who narrowly escaped death, the World Health Organization came up with criteria based on parameters of organ dysfunction and management termed as 'maternal near miss'. It is defined as pregnant or recently delivered woman who survived a complication during pregnancy, childbirth or 42 days after termination of pregnancy. The classification includes three types of criteria: disease-, intervention-, and organ dysfunction-based.^[3] as quantifying causes of maternal mortality is difficult, there is a notion of SAAM

which refers to a life-threatening disorder that can end up in near miss with or without residual morbidity or mortality.^[4] Although some of these women die, a proportion of them narrowly escape death. These criteria help to find out prevalence of near miss which is comparatively higher in developing countries and causes are like those of maternal mortality like hypertensive disorders, hemorrhage, sepsis, anemia and obstructed labor.

Reviewing near miss cases provides insight regarding efficacy of healthcare delivery system and the three delays in seeking health care so that appropriate action is taken. Near miss and maternal deaths together are referred to as Severe Maternal Outcome (SMO). This data plays an important role in designing, planning and implementing programs directed towards safe motherhood practices.

OBJECTIVES

To audit maternal near miss cases and to find out maternal near miss incidence ratio in a tertiary care center, their management and outcome.

MATERIALS AND METHODS

This is a prospective observational study conducted at a tertiary care center in women admitted in obstetrical ward/obstetrical ICU, fulfilling WHO maternal near miss criteria (2009), in the Department of Obstetrics and Gynecology from January to December 2022. Our institute serves as a referral center for both public and private sector hospitals in 100 kms radius. Along with providing 24 hours emergency obstetric care, the hospital antenatal care and delivery services for both low and high-risk pregnancies. The institute also has 24 hours working blood bank service. High Dependency Unit (HDU) and obstetric ICU in labor room complex with readily available team of highly skilled obstetricians and other faculties of medicine make a worthwhile contribution to our effort of saving maternal live.

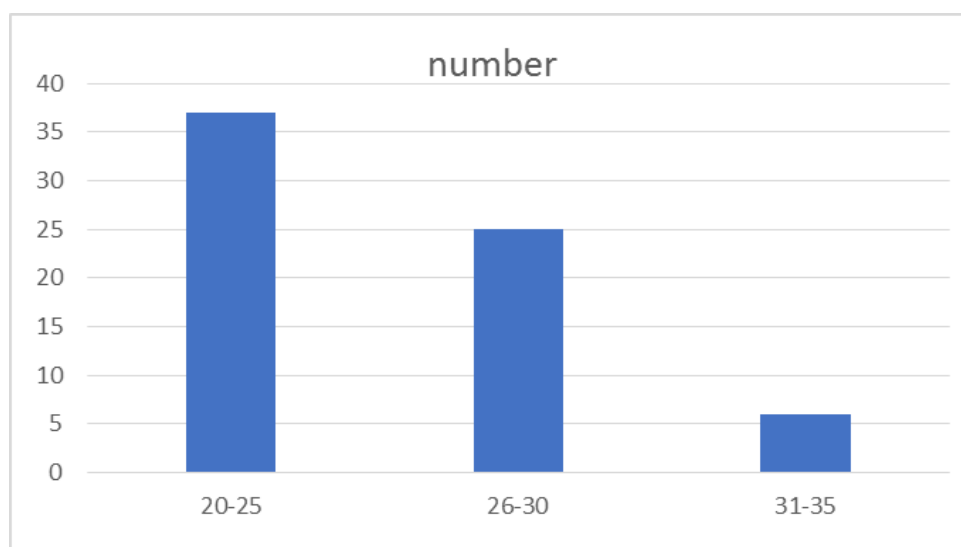
All potentially life-threatening cases were identified, diagnosed and evaluated as per laboratory, clinical and management-based criteria laid down by WHO 2009 and were included in the study. Patients were categorized after final diagnosis with respect to hemorrhage, hypertension, abnormal placentation, uterine rupture and

inversion. Anemia and thrombocytopenia were commonly seen in all the categories as an indirect cause. Maternal near miss incidence ratio was calculated which refers to number of maternal near miss cases per 1,000 live births. This study focuses on various ways of management used in treating these women that led to their successful recovery and discharge from our institute.

RESULTS

During the study period of one year i.e., from January to December 2022, there were a total of 68 near miss cases which were successfully diagnosed, managed and discharged from our institution.

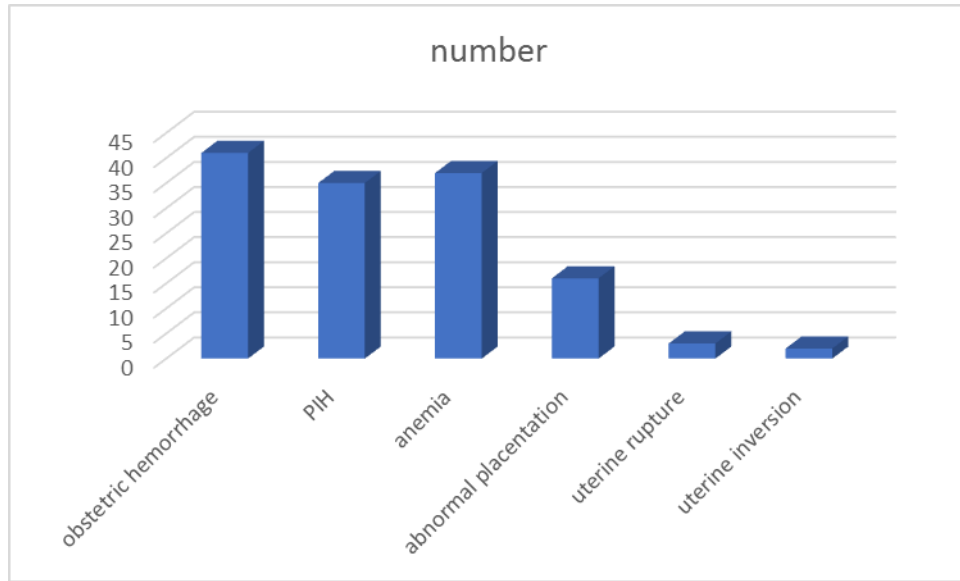
Among the study population, majority belonged to age group of 20-25 years (54.41%) and 26-30 years (36.76%). Multigravidas accounted for (70.58%) and primigravidae were (29.41%). A high proportion of cases were from rural areas (79.41%) making role of the three delays more evident in managing these patients.



Graph 1: Age (in years) wise incidence of near miss.

The percentage of booked cases was (80.88%) while that of un-booked cases was (19.11%). Being a tertiary care center catering for a population within 100 kms radius, vast majority of cases were referred accounting for (92.64%). We had (94.11%) undelivered cases amongst total cases of near miss.

Among the direct causes of near miss, commonest was obstetrical hemorrhage (60.29%) followed by hypertensive disorders of pregnancy (51.47%) and abnormal placentation (23.52%). Severe anemia was the most common indirect cause found in (54.41%). Hematological system was most involved (58.82%).



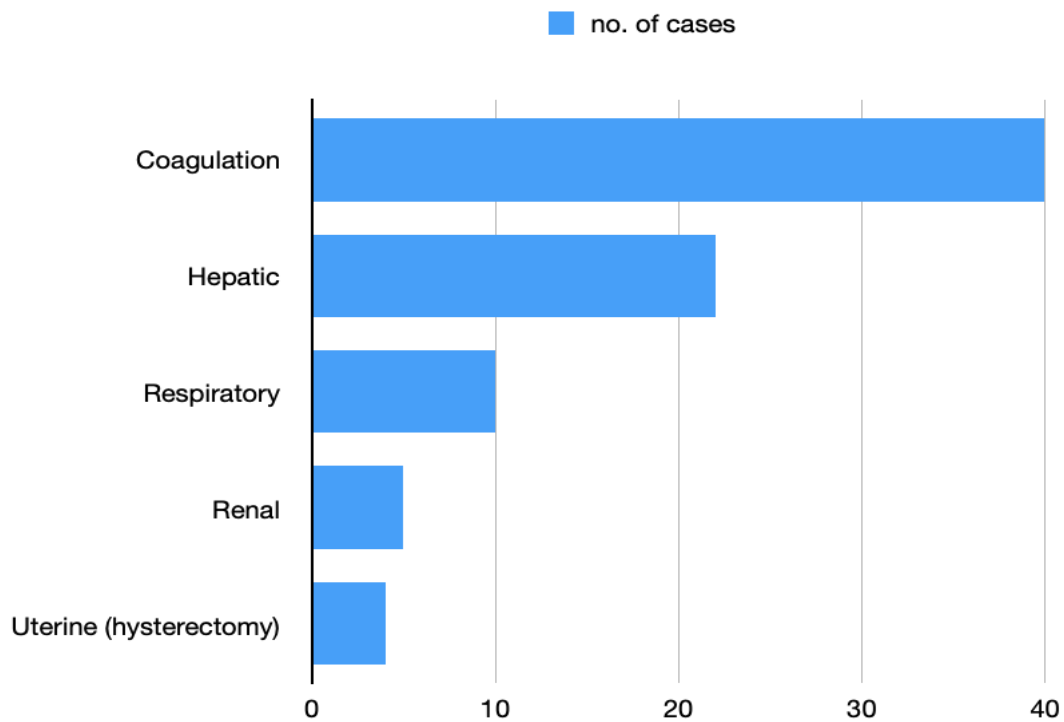
Graph 2 – Causes of maternal near miss.

Nearly (52.94%) cases required surgical intervention in the form of bilateral uterine artery ligation (44.11%), bilateral internal iliac artery ligation (5.88%), B-Lynch

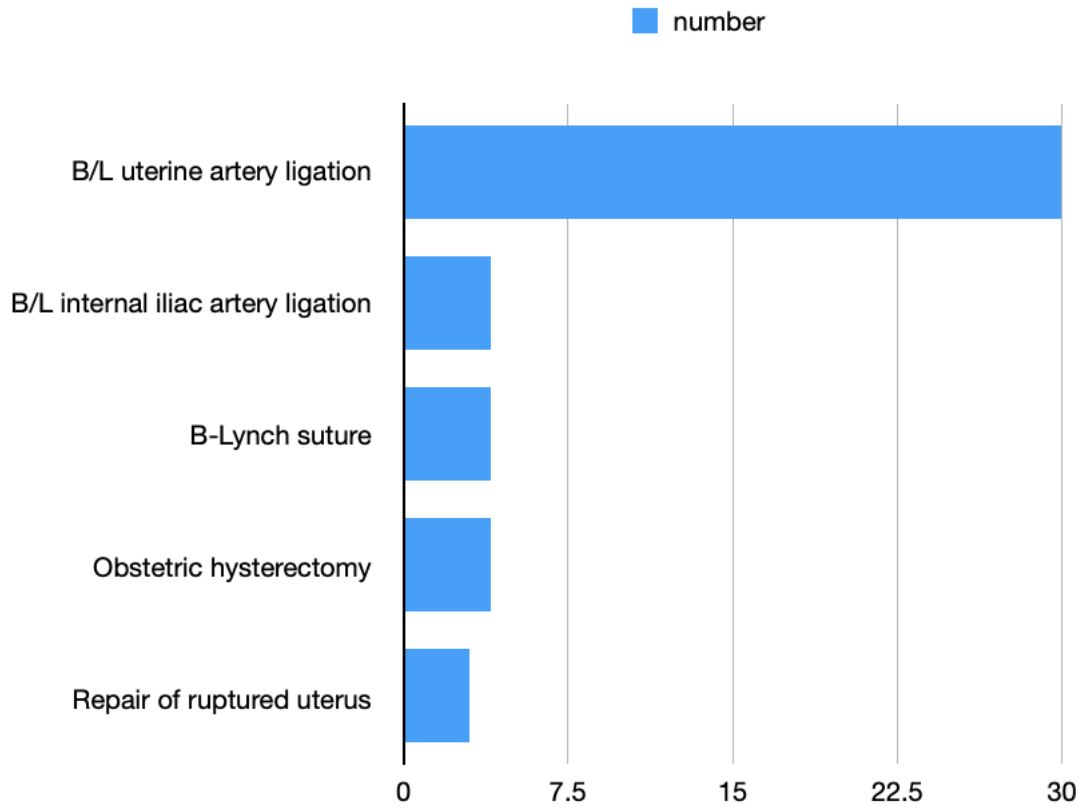
suture application (5.88%), obstetric hysterectomy (5%) and repair of ruptured uterus (4.41%).

Table 1: Causes of maternal near miss.

Causes of maternal near miss	Percentage (%)
Obstetric hemorrhage	60.29%
Hypertensive disorders of pregnancy	51.47%
Severe anemia	54.41%
Abnormal placentation	23.52%
Uterine rupture	05.88%
Uterine inversion	02.94%



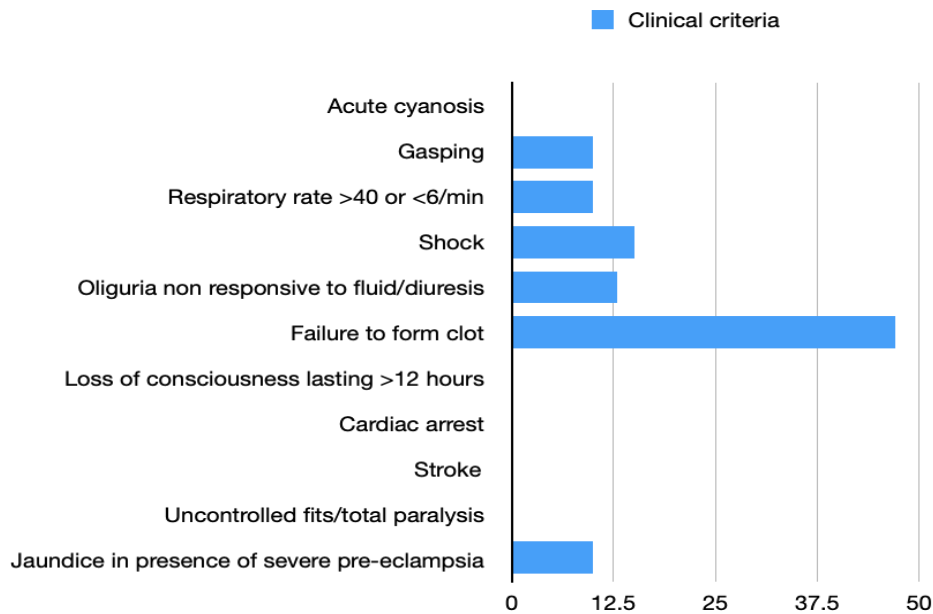
Graph 3: Most common organ system involved.



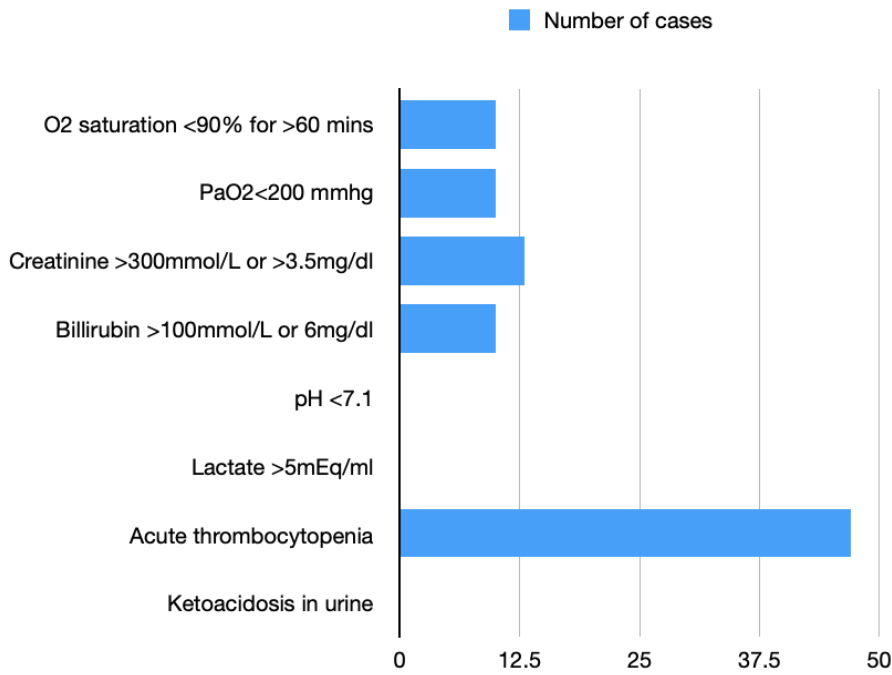
Graph 4: Various methods of surgical intervention used

The most involved clinical criteria were failure to form clot in (69.11%) and accordingly the laboratory-based criteria were acute thrombocytopenia. Continuous usage of vasoactive drugs was needed in (22.05%), ventilatory support for > 60 minutes unrelated to anesthesia required

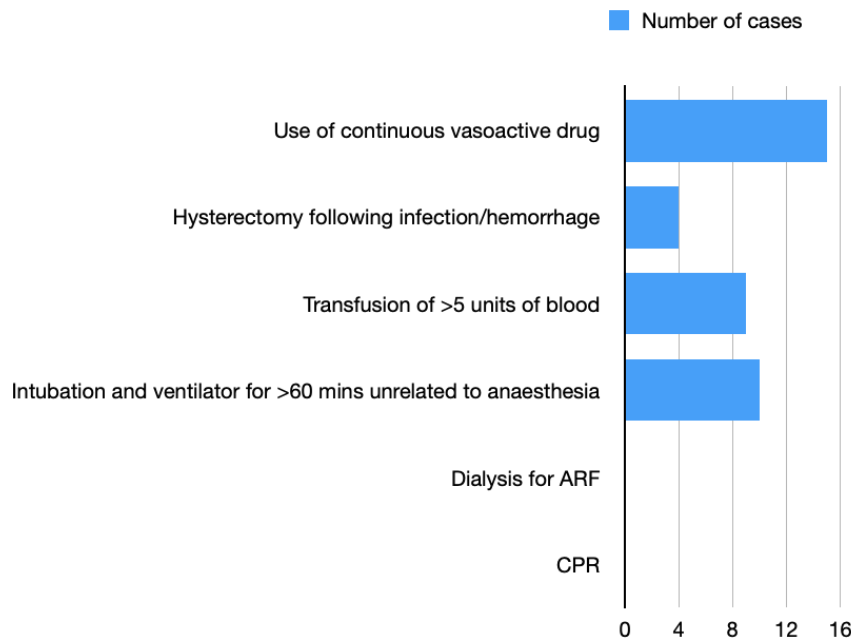
in (14.70%) while more than 5 units of blood transfusion was needed in (13.23%). The maternal near miss incidence ratio (MNMR) was 6.39/1000 live births in our hospital.



Graph 5: Distribution as per clinical criteria.



Graph 6: Distribution as per laboratory-based criteria.



Graph 7: Distribution as per management-based criteria.

DISCUSSION

After identifying the problem, appropriate solution must be found out in order to reduce further incidences. Reducing maternal mortality needs multidisciplinary effort.

Being a tertiary care center, majority of patients get referred from a 100 kms radius. With a highly equipped HDU (high dependency unit), 24 hours availability of ICU, a team of highly skilled obstetricians, expert anesthesiologists, operation theatre and blood bank services, many lives were benefitted.

In a study conducted by Singh Abha et al.^[5] represents a study conducted in a tertiary care hospital in India and results showed there was no significant difference between maternal near miss due to clinical (31%) and laboratory-based criteria (30%). However, the management-based criteria had a higher incidence of maternal near miss (39%). Also, the most common causes of near miss were hypertensive disorders of pregnancy (38.8%) and hemorrhage (22.2%) with involvement of hematological system in (36.49%). We found similar results with obstetrical hemorrhage and hypertensive disorders of pregnancy being the leading cause of maternal near miss. The results were also

comparable to a study conducted in tertiary care center by Shailja Verma et al^[6], Samarina Kamal et al.^[8]

In our study, it was seen that majority of patients belonged to age group of 20-25 years (54.41%) and multigravidas (70.58%) were more affected as compared to primigravidae. Type 2 delay was seen as a major contributing factor in maternal morbidity as (92.64%) cases were referred to our institution. A delay in decision regarding referral of the patient and time required to reach a tertiary care institute once the decision is made greatly affects the outcome of the patient. With widespread availability of ambulance services, some reduction is seen in this delay, but a lot more requires to be done in this matter. Similar results were obtained in a study done by Deepti Gupta et al^[7] in a tertiary care hospital in central India with (39.1%) cases belonging to age group 15 -20 years.

With availability of skilled obstetrician and anesthesiologists along with blood bank support round the clock, timely surgical intervention in the form of bilateral uterine artery ligation, B-Lynch suture, bilateral internal iliac artery ligation and obstetric hysterectomy, if need be, has been of immense importance in managing cases of obstetric hemorrhage which was most common cause of near miss in our institute. The availability of obstetric ICU with multidisciplinary approach in management has proved to be of immense help in dealing with such cases.

The most important risk factor in maternal near miss in our study was anemia which was seen in (54.41%) cases. Even after constant efforts by all the governmental and non-governmental agencies, anemia continues to be a silent killer in majority of pregnant women. Regular ANC visits and compliance to iron therapy during pregnancy significantly reduces risk of maternal compromise during and after labour.

The maternal near miss incidence ratio calculated for our study turned out to be 6.79/1000 live births in our hospital. Various available studies show results ranging from 5.9 per 1000 live births in a study conducted by Yuan Ying Ma et al^[9] to that between 10-40/1000 live births.^{[7],[10],[12],[13]} As this is a tertiary care hospital, we receive many critically ill patients all surrounding districts and with our multidisciplinary approach, we have successfully treated them so far. To address the severity of this issue at grassroot level, we have established a telephonic network involving medical officers of nearby RH and PHCs in order to get notified beforehand when a critically ill obstetric patient is being referred to our institute. This way, our team gets ready well in time to give the best possible life saving care for the patient. This novel approach has helped us in reducing the incidence of maternal near miss and thereby maternal mortality.

CONCLUSION

Auditing maternal near miss cases has been of immense importance in reducing maternal mortality as factors that lead to adverse obstetric outcomes are similar. Obstetric hemorrhage, hypertensive disorders of pregnancy and anemia were major causes of maternal near-miss. As the survival is achieved, pre-existing problems that led to near miss were addressed on a larger scale. Strengthening of health-care services at all levels can surely bring down both maternal near miss and mortality. With keeping this in mind, we have tried to reduce the occurrence of delay and near-miss by establishing a telephonic network of medical officers of rural and urban health care centers. That way we are notified well beforehand when a morbid patient is being shifted to our institute for further management. This has been of a great value in saving patients' lives. Hence utilizing the concept of maternal near miss can help us in providing better maternal care.

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