Short Communication

Journal of Nurse Midwifery and Maternal Health
Volume 1 Number 2, July - December 2015

Maternal Near Miss

S. Elizabeth Jasmine*, Indira. S**

Author Affiliation: *Associate Professor in OBG Department, **Principal, Narayana College of Nursing, Nellore – 524003, Andhra Pradesh.

Introduction

A *maternal near miss (MNM)* is an event in which a pregnant woman comes close to maternal death, but does not die – a "near-miss". Traditionally, the analysis of maternal deaths has been the criteria of choice for evaluating women's health and the quality of obstetric care. Due to the success of modern medicine such deaths have become very rare in developed countries, which has led to an increased interest in analyzing so-called "near miss" events.

Definition

The World Health Organization defines a maternal near-miss case as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy."

Purposes

1. Determine the frequency of severe maternal complications, maternal near-miss cases and evaluate a health-care facilities or the health-system's performance (depending on the health-care level at which the approach is implemented) in reducing severe maternal outcomes.
2. Determine the frequency of use of key interventions for the prevention and management of severe complications related to pregnancy and childbirth.
3. Araise awareness about, and promote reflection of, quality-of-care issues and foster changes towards the improvement of maternal health care.

Uses of Maternal Near Miss

1. Evaluating the quality of obstetric care using near-miss audits.
2. Documenting the long-term consequences of maternal ill health for designing postnatal interventions.
3. Learning from women's personal accounts of near-miss and their experiences of care.
4. Identifying the prevalence of maternal illness and death for prevention.
5. Estimating the met need for surgery to evaluate safe motherhood programmes.

Near-Miss Concept

Women who survive life-threatening conditions

Reprint Request: S. Elizabeth Jasmine, Associate Professor in Obg Department, Narayana College of Nursing Nellore–524003, Andhra Pradesh.
E-mail: Gadhnila04@Gmail.Com

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.

Near-Miss Approach

1. Baseline assessment (or reassessment)
2. Situation analysis
3. Interventions for improving health care

Criteria According To System

1. *Cardiovascular Dysfunction*
   - ❖ Shock
   - ❖ Cardiac Arrest
   - ❖ Severe hypoperfusion (lactate >5 mmol/ L or >45 mg/ dL)
   - ❖ Severe acidosis (pH<7.1)
   - ❖ Use of continuous vasoactive drugs
   - ❖ Cardio-pulmonary resuscitation
2. *Respiratory Dysfunction*
   - ❖ Acute cyanosis
   - ❖ Gasping
   - ❖ Severe tachypnea (respiratory rate> 40 breaths per minute)
   - ❖ Severe bradypnea (respiratory rate< 6 breaths per minute)
   - ❖ Severe hypoxemia (O2 saturation < 90% for e"60min or PAO2/FiO2< 200)
   - ❖ Intubation and ventilation not related to anaesthesia
3. *Renal Dysfunction*
   - ❖ Oliguria non responsive to fluids or diuretics
   - ❖ Severe acute azotemia (creatinine > 300 ìmol/ml or >3.5 mg/ dL)
   - ❖ Dialysis for acute renal failure
4. *Coagulation Dysfunction*
   - ❖ Failure to form clots
   - ❖ Severe acute thrombocytopenia (< 50,000 platelets/ml)
   - ❖ Massive transfusion of blood or red cells (≥ 5 units)
5. *Hepatic Dysfunction*
   - ❖ Jaundice in the presence of pre-eclampsia
   - ❖ Severe acute hyperbilirubinemia (bilirubin> 100 ìmol/ L or >6.0 mg/ dL)
6. *Neurologic Dysfunction*
   - ❖ Prolonged unconsciousness or coma (lasting>12 hours)
   - ❖ Stroke
   - ❖ Uncontrollable fit / status epilepticus
   - ❖ Global paralysis
7. *Uterine Dysfunction*
   - ❖ Hysterectomy due to uterine infection or haemorrhage

Classification of Maternal Near Miss

First Classification

It must be practical and understood by its users (clinicians, epidemiologists and program managers)

Second Classification

Underlying causes must be exclusive of all other conditions; as in the Inter national Statistical Classification of Diseases and Related Health Problems (ICD), the underlying cause is the disease or injury which initiated the sequence of events leading directly to death, or the circumstances of the ac cident or violence which produced the fatal injury.

Third Classification

It should be compatible with and contribute to the 11th revision of the ICD. Incorporating this maternal death classification into the ICD will encourage consistent use in both death certificates and confidential enquiries into maternal deaths, and improve the comparability of data.

Maternal Near-Miss Indicators

Maternal Near-Miss (MNM) refers to a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy. *Maternal Death (MD)* is the death of a woman while pregnant or within 42 days of termination of pregnancy or its management, but not from accidental or incidental causes. *Live Birth (LB)* refers to the birth of an offspring which breathes or shows evidence of life. *Severe maternal outcome refers to* a life-threatening condition (i.e. organ dysfunction), including all maternal deaths and maternal near-miss cases. *Women With Life-Threatening Conditions (WLTC)* refers to all women who either qualified as maternal near-miss cases or those who died (i.e. women presenting a severe maternal outcome). It is the sum of maternal near-miss and maternal deaths (WLTC = MNM + MD). *Severe Maternal Outcome Ratio (SMOR)* refers to the number of women with life-threatening conditions (MNM + MD) per 1000 live births (LB). This indicator gives an estimate of the amount of care and resources that would be needed in an area or facility [SMOR = (MNM + MD)/LB]. *MNM Ratio (MNMR)* refers to the number of maternal near-miss cases per 1000 live births (MNMR = MNM/LB). Similarly to the SMOR, this indicator gives an estimation of the amount of care and resources that would be needed in an area or facility. *Maternal Near-Miss Mortality Ratio* (MNM : 1 MD) refers to the ratio between maternal nearmiss cases and maternal deaths. Higher ratios indicate better care. *Mortality Index* refers to the number of maternal deaths divided by the number of women with life-threatening conditions expressed as a percentage [MI = MD/(MNM + MD)]. The higher the index the more women with life-threatening conditions die (low quality of care), whereas the lower the index the fewer women with life-threatening conditions die (better quality of care). *Perinatal outcome indicators* (e.g. perinatal mortality, neonatal mortality or stillbirth rates) in the context of maternal near-miss could be useful to complement the quality-of-care evaluation.

Conclusion

Maternal near-miss refers to situations where women experience severe life-threatening obstetric complications during pregnancy, delivery or post pregnancy which they survive either by chance or because they receive good care at a facility. Cases of near-miss occur in larger numbers than maternal deaths - it has been estimated that up to 9 million women survive obstetric complications every year, and the consequences of these may be permanent and wide-reaching.

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