

REVIEW ARTICLE

Near-Miss/Severe acute maternal morbidity (SAMM): A new concept in maternal care

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Summary:

A near-miss obstetric morbidity means a woman (in pregnancy/labour/puerperium) who almost died but survived. The near-miss: mortality ratio is a possible new indicator of maternal care and could be used to compare improvements in treatments more accurately than mortality date alone. Criteria to define and identify the cases vary greatly. The incidence ranges from 0.07% to

8.23% and the case fatality ratio from 0.02% to 37%. Massive obstetric haemorrhage and hypertensive disorders of pregnancy are two important primary obstetric causes of near-miss morbidity. Mortality index (MI) in one of the potential method of assessing the care received by SAMM cases. Population based surveys are considered preferable to collect informations of near-miss.

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Introduction:

Despite therapeutic advances during this century and a growing perception of the safety of child birth, morbidity and mortality continue to occur in obstetric patients¹. More than one woman dies every minute from such causes; 585,000 woman die each year². In addition to maternal death, women experience more than 50 million maternal health problems annually³. As many as 300 million women-more than one quarter of all adult women living in the developing world currently suffer from short of long term illness and injuries related to pregnancy and child birth⁴. For every maternal death there are many serious life threatening complications of pregnancy. Yet relatively little attention has been given to identifying a general category of morbidity that could be called near-misses⁵. Stones et al⁶ were the first to use the term “nearmiss morbidity” to define a narrow category of morbidity encompassing “potentialiy life threatening episodes”. This concept is relatively new in maternal care, but is increasingly becoming important in areas with low maternal mortality ratios or where the geographical area is small^{6,7}.

Why Important:

The analysis of maternal deaths has long been used for the evaluation of women’s health and the quality

of obstetric care⁸. Over the last decade, the identification of cases of severe maternal morbidity has emerged as a promising complement or alternative to the investigation of maternal deaths^{6,9,10}. It has been suggested that with the observed decline in maternal mortality, analysis of well defined near-miss cases may be a more sensitive measure of the standard of obstetric care^{11,12}. Characterizing near-miss morbidity is valuable for monitoring the quality of hospital based obstetric care and for assessing the incidence of life threatning complications¹³. Incorporation of near-misses into maternal death enquiries would strengthen these audits by allowing for more rapid reporting; more robust conclusions, comparisons to be made with maternal deaths, reinforcing lessons learnt, establishing requirement for intensive care and calculating comparative indices¹⁴.

What a near- miss means:

Every woman can experience sudden and unexpected complications during pregnancy, child birth and just after delivery. Morbidity during pregnancy represents part of a continuum between extremes of good health and death. On this continuum a pregnancy may be thought of as being uncomplicated, complicated, severely complicated or life threatening (Figure-1)⁹. From these conditions the woman may recover, she may be temporarily or permanently disabled or she may die. Death is the last stop on a continuum of adverse events. Survival of a pregnant woman is dependent on the disease, her basic health, the health care facilities and the personnel of the health care system¹⁴.

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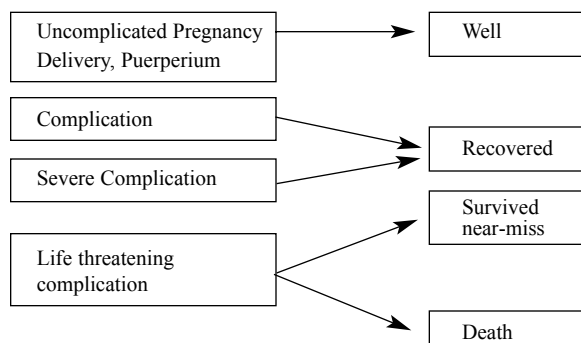


Figure:

Definitions:

There is debate surrounding what constitutes the optimum definition of severe obstetric morbidity. A number of terms are in use to describe incidents of severe maternal ill health including life-threatening complications, severe maternal morbidity or near misses⁸. Three types of approaches have been proposed for defining life threatening obstetric complications and near miss events. These approaches include definitions based on (a) management (b) clinical signs and symptoms and (c) organ systems⁹.

By Mantel GD et al, a near miss describes a patient with acute organ system dysfunction, which if not treated appropriately, could result in death¹⁵. Prual A et al, has defined severe maternal morbidity as severe complications from 28th week of gestation to 42nd day postpartum that would have resulted in death of the mother or a definite invalidating sequelae without medical intervention¹⁶. Some studies have used intensive care unit (ICU) admissions to define near miss morbidity^{10,15,18}. According to Murphy DJ et. al, all- women admitted for ICU in pregnancy or upto 42 day postpartum are considered as near-miss maternal mortality¹⁹. By Pattinson RC et al., Severe Acute Maternal Morbidity (SAMM) also known as “near-miss” case means a woman with organ dysfunction or failure who would have died had it not been that luck or good care was on her side²⁰. During an international seminar held in Morocco, a near-miss case was defined as “any pregnant or recently delivered or aborted woman whose immediate survival is threatened and who survives by chance or because of the hospital care received²¹.”

Controversies in definitions:

In developed countries, most of the definitions of life threatening obstetric complications and near-miss events are management based⁸. Admission to intensive care has been taken as the most commonly used management criterion^{6,10,11,17-19,22-27}. Other examples of management criteria used in the definition of life threatening complications include the use of emergency hysterectomy^{15,28-34}, caesarean section³⁵ blood transfusion³⁵ hospitalization for more than four days³⁵ and anaesthetic accidents¹⁵.

The most frequently used definition based on management was admission to ICU. The main advantage of this definition was its simplicity and the ease of data collection⁸ but admission to ICU may not be an ideal end point since it is sometimes influenced by factors other than the extent of morbidity, for example, differences in policies among different maternity units or sometimes the availability of beds in an intensive care unit³².

When the definitions are based on clinical signs and symptoms there remain several difficulties. These definitions require the consensus of clinicians on criteria of severity, which can be difficult to obtain given the diversity of clinical experience⁸. As for example, severe vaginal bleeding has been defined by Girard F. et al, (France, 2001)³⁶ as blood loss > 1500 ml if measured or haemorrhage leading to abnormalities of coagulation; whereas Prual A. et al, (Niger, 1998)³⁷. has suggested hypovolemic shock requiring blood transfusion to be considered as severe vaginal bleeding and Mantel et. al (South Africa 1998)¹⁵ considered hypovolemia requiring 5U blood as severe vaginal bleeding.

The organ system based definition used by Mantel et al.¹⁵ and Schoon MG may be the most accurate definition of a life threatening complication or near-miss in that the diagnosis requires technologies which may not be available in many developing country hospitals (for example: oxygen saturation).

Incidence /Prevalence:

Epidemiological data about maternal morbidity are rare. Large discrepancies exist between the surveys due to different inclusion criteria. The incidence of severe maternal morbidity ranges from 0.07 to 8.23%,

the case fatality ratio from 0.02 to 37%⁸. There is a big difference between case fatality ratio in developing and developed countries. For example, the studies conducted in Niger, Benin and Malaysia given the morbidity to mortality ratio as 11-12^{13,37,39}, while this is 117-223 in studies conducted in Europe^{36,40} in the category where disease specific criteria are used. The same applies to the category of organ system based criteria, morbidity: mortality ratio is 5-8 in South Africa^{15,20,37} and 49 in Scotland⁴¹. The high case fatality rates of several complications reflect a poor quality of obstetric care.

Cause of near-miss morbidity:

In different studies, the primary obstetric causes of severe maternal morbidities have been found to be hypertensive disorders of pregnancy, massive obstetric haemorrhage and sepsis^{15,16,20,39-41,43}. Obstructed labour has been found to be an important cause in some studies^{16,39}.

Risk factors:

The risk factors of severe maternal morbidities have been identified as *maternal age >34, *social exclusion, *non-white, *hypertension, *previous PPH, *delivery by emergency caesarean section, *multiple pregnancy and *antenatal admission to hospital⁴⁰. Low status of women who do not attend antenatal care in a given health unit but are referred there when they develop life-threatening obstetric complications, contribute significantly to maternal morbidity⁴². Induced abortions conducted by untrained village midwife (DAI) is still a major cause of morbidity in the developing countries⁴³.

Methods of assessing the care received by SAMM cases:

Different approaches are used as potential methods of assessing the care SAMM cases receive. Mortality Index (MI) is defined as the ratio of maternal deaths among the SAMM cases to the sum of maternal deaths and SAMM cases^{14,44}. It represents the proportion of women who presents with a SAMM and subsequently dies⁴⁴. Another approach is to calculate the ratio of SAMM to mortality^{40,41}.

The term "Conversion rate" was used for the first time by Pattinson RC et al.,. By them, the conversion rate is the number of maternal deaths SAMM +

maternal deaths and expressed as a percentage. It gives an indication of how successful is the clinician in treating a particular complication²⁰.

How to collect information's of near-miss cases:

Since the majority of cases of life threatening complications require hospital care to save the women's life, the hospital records are the most likely source of information on these complications⁴⁵. But the problems are: many patients may not reach to a health care facility (particularly in a developing country), registers may be incomplete and informations may have to be collected from a series of registers other than obstetric unit. In a review prepared by Minkauskiene M⁸, it has been suggested that population based surveys^{16,3-5,38,40,47}, are preferable because the situation has to be depicted in a complete health area taking into account all medical facilities playing a role in obstetric health fields.

Conclusion:

Severe obstetric morbidity and its relation to mortality may be more sensitive measures of pregnancy outcome than mortality alone⁴⁰. Including SAMM in maternal death audit increases the rapidity with which health system problems can be identified⁴⁷. But the criteria currently used to identify a near-miss vary greatly. There is a clear need to set uniform criteria to classify patients as SAMM. This standardization could be made for similar settings separately⁴⁸.

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