

Implementation of WHO Near-Miss Approach for Maternal Health at a Tertiary Care Hospital: An Audit

Venkatesh Shilpa · Chinmayi · Ramkumar Vani ·
Sheela C. N. · Thomas Annamma

Received: 28 April 2014 / Accepted: 19 February 2015 / Published online: 15 March 2015
© Federation of Obstetric & Gynecological Societies of India 2015

About the Author



Dr. Shilpa Venkatesh is a senior resident in the Department of Obstetrics & Gynecology, at St. Johns Hospital, Bangalore. She has a keen interest in research and publications

Abstract

Objective The objective of this study was to evaluate severe maternal outcomes (including maternal deaths and maternal near-miss cases).

Materials & Methods A prospective study of severe maternal outcomes (including maternal deaths and maternal near-miss cases) from May 2012 to April 2013 was performed. For each woman, data were collected on the occurrence of selected severe pregnancy-related complications, the use of critical interventions, and admissions to intensive care unit

Results The total number of deliveries were 2340. The number of maternal deaths was three. The natures of the

near-miss cases during the study period were recorded. Prevalence of SAMM (severe acute maternal morbidity) was 2.025 %.

Conclusion In areas where the maternal mortality is low, there is a need to shift focus to maternal near-miss cases or SAMM, which is a useful adjunct to maternal death enquiries

Keywords Near miss · SAMM (severe acute maternal morbidity) · PPH

Introduction

The Millennium Development Goal-5 is to reduce maternal mortality by 75 %. The factors that surround maternal death are often peculiar to the event, and are not generalizable. Diseases causing death are often very rare, and the information gained from analyzing the death, although useful, is limited to those very few people with the condition [1]. In areas where the maternal mortality is low, there is a need to

Venkatesh S. (✉), Senior Resident · Chinmayi,
Postgraduate · Ramkumar V., Professor ·
Sheela C. N., Professor ·
Thomas A., Professor
Department of OBG, St. John's Medical College,
Bangalore, India
e-mail: shilpavenkatesh1280@gmail.com

shift focus to maternal near-miss cases or SAMM (severe acute maternal morbidity), which is a useful adjunct to maternal death enquiries.

Definition

A maternal near-miss case or SAMM is a woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy [2].

Objective of Study

To evaluate severe maternal outcomes (including maternal deaths and maternal near-miss cases).

Materials & Methods

A prospective study of severe maternal outcomes (including maternal deaths and maternal near-miss cases) in the Department of Obstetrics & Gynecology, St. John's Medical College Hospital Bangalore, from May 2012 to April 2013 was performed. The total number of deliveries and total number of live births were recorded. For each woman, data were collected on the occurrence of selected severe pregnancy-related complications, the use of critical interventions, and admissions to intensive care unit.

Inclusion Criteria for Near-Miss Case [2]:

1. *Disease-specific criteria* PPH, severe preeclampsia/eclampsia, sepsis, rupture uterus, severe complications of abortion.
2. *Organ System-based criteria* Cardiovascular dysfunction, respiratory dysfunction, renal dysfunction, coagulation/hematological dysfunction, hepatic dysfunction, neurological dysfunction, uterine dysfunction.
3. *Critical Interventions* ICU care, laparotomy (includes hysterectomy and excludes Cesarean delivery), interventional radiology, Use of blood products.

Results

The total number of deliveries were 2340 (May 2012–April 2013). The number of maternal deaths was three.

Discussion

The comprehensive emergency obstetric care available at SJMCH has made maternal mortality an unusual event. Hence, the need to shift our focus to maternal near-miss

cases. Data collected on near-miss cases or SAMM helps us identify health system failures or priorities in maternal health care more rapidly than maternal deaths [3]. Its routine use as an indicator, however, is limited due to the lack of uniform criteria of identification of cases. Prevalence of SAMM (maternal deaths plus near misses divided by number of women giving birth) across the world varies depending on the criteria used to identify the near-miss cases (Tables 1, 2).

Prevalence of eclampsia in our study, was 7.69 per 1000 deliveries (18 in number). However, only four patients have been included as SAMM (as shown in Table 3). This is because only four patients with eclampsia had neurological dysfunction (according to the WHO criteria for SAMM). Neurological dysfunctions according to the WHO criteria include: prolonged unconsciousness (lasting ≥ 12 h)/coma (including metabolic coma), stroke, uncontrollable fits/status epilepticus/total paralysis [4].

Although the literature shows PPH as the leading cause of maternal near-miss cases, the incidence of PPH as a leading cause was comparatively less in our study. This may be because of active management of third stage of labor and also attributable to our well-equipped and round-the-clock blood-bank facilities. PPH has been classified as

Table 1 Prevalence of severe maternal complications

Maternal complications	Number of patients	Prevalence (per 1000 deliveries)
Severe preeclampsia	152	64.9
Eclampsia	18	7.69
Ectopic pregnancy	52	22.22
Cardiac disease complicating pregnancy	29	12.39
Severe factor X deficiency in pregnancy	1	0.427
Idiopathic thrombocytopenic purpura	14	5.982
Von willebrands disease	3	1.282
Anemia	97	41.45
Antepartum hemorrhage	46	19.65
PPH	40	17.09
APLA	2	0.85
AFLP	2	0.85

Table 2 Maternal deaths

Maternal complication	Cause of death
Cardiac disease in pregnancy (RHD with severe MS with MR, status post prosthetic valve)	Cardiac arrest secondary to mitral valve dysfunction
Acute fatty liver of pregnancy	Acute renal failure, DIC, sepsis
Sepsis with Fetal demise	Septic shock, metabolic acidosis

Table 3 Near-miss maternal cases

Maternal complication	Near-miss criteria (Organ Dysfunction)	Number of patients	Critical intervention
Eclampsia	Uncontrolled fits	4	ICU admission
Abruptio Placenta	DIC	3	ICU care + transfusion of blood products
Ruptured ectopic pregnancy	Hemorrhagic shock	28	Laparotomy
Cardiac disease complicating pregnancy		7	ICU care (1-Balloon valvuloplasty)
PPH	Hemorrhagic shock	5 (3-Atonic PPH) (2-Central placenta previa)	All required ICU care. Among them, 2 needed obstetric hysterectomy
Uterine inversion	Hemorrhagic shock	1	
Rupture uterus	Hemorrhagic shock	2	Obstetric hysterectomy
Sepsis	Septic Shock	2	ICU care
Contributory/associated conditions		5 (1-Rickettsial fever, 1-dengue, 1-malaria, 1-pneumonia, 1-ARDS)	All required ICU care

Table 4 Prevalence of SAMM

Criteria used to identify SAMM	Prevalence of SAMM (%)
Disease-specific criteria	0.8–8.23
Organ system-based criteria	0.38–1.09
Management-based criteria	0.01–2.9
Our study (Organ system-based + management-based criteria)	2.025

a near miss only in case of critical interventions (Table 4). (i.e., laparotomy, obstetric hysterectomy or transfusion of ≥ 5 units of packed cells) according to the WHO criteria. In our study, ruptured ectopic pregnancy requiring laparotomy emerged as the leading cause of SAMM. This may be explained by the fact that there is an increasing trend observed in ectopic pregnancy in recent times and also that these patients are often referred late. Ectopic pregnancy is the main cause of maternal mortality in the first trimester of pregnancy and is responsible for 80 % of maternal deaths in this phase [4].

St. John's hospital, being a referral center, has a wide-spread catchment area. The three most common maternal complications during the study period were severe preeclampsia, anemia, and ectopic pregnancy. The survival of the maternal near-miss cases at our hospital is largely attributed to the following factors:

1. 24/7 comprehensive emergency obstetric care.
2. Prompt diagnosis and early, appropriate intervention.
3. Excellent ICU care.
4. Standard protocols in place (in line with the best evidence-based practices) to handle obstetric emergencies.

- Active management of third stage of labor for prevention of PPH [5].
 - All women with impending eclampsia and those who have had an eclamptic fit receive magnesium sulfate [6].
 - Women undergoing a cesarean delivery receive prophylactic antibiotics [7].
5. Round-the-clock blood-bank facilities with easy availability of blood and blood products.

Conclusion

Maternal mortality has become a rare event in an urban setup, and hence, the causes surrounding the death per se cannot be generalized. The incorporation of organ dysfunction and the specific intervention in the study improved the prevalence of maternal near miss, and hence, we recommend that both these criteria be used to identify SAMM.

Compliance with ethical requirements and Conflict of interest All authors declare that there have been no conflicts of interest. No informed consent taken since it is an audit conducted at our hospital.

References

1. Pattinson RC, Hall M. Near Misses: a useful adjunct to maternal death enquiries. *Br Med Bull.* 2003;67:231–43.
2. Say L, Souza JP, Pattinson RC. WHO working group on Maternal mortality and morbidity classifications. Maternal near misses towards a standard tool for monitoring the quality of maternal

- health care. *Best Pract Res Clin Obstet Gynecol.* 2009;23(3): 375–88.
3. Say L, Pattinson RC, Gülmezoglu AM. WHO systematic review of maternal mortality and morbidity: the prevalence of SAMM (near miss). *Reprod Health.* 2004;1(1):3.
 4. Agdi M, Tulandi T. Surgical treatment of ectopic pregnancy. *Best Pract Res Clin Obstet Gynecol.* 2009;23(4):519–27.
 5. World Health Organization. WHO recommendations for prevention of postpartum hemorrhage. Geneva: WHO; 2007.
 6. Duley L, Gülmezoglu AM, Henderson-Smith Magnesium sulfate and other anticonvulsants for women with preeclampsia. *Cochrane Database Syst Rev,* 2007, 4.
 7. Smaill F, Hofmeyr GJ Antibiotic prophylaxis for cesarean section. *Cochrane Database Syst Rev,* 2007, 4.