

International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2020; 4(2): 86-89
Received: 25-01-2020
Accepted: 27-02-2020

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A study of near miss cases in obstetrics at a tertiary care centre

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DOI: <https://doi.org/10.33545/gynae.2020.v4.i2b.509>

Abstract

Maternal mortality data in practical terms is the tip of an iceberg and the maternal near miss data is invisible and which is very important tool to reduce the maternal mortality. The aim of this study was to determine the frequency and etiology of near miss events. This prospective observational study was done at a tertiary care institute from June 2017-May 2019. The data was collected from obstetric emergency patients as per criteria defined by the WHO including clinical, laboratory & management criteria. The incidence ratio, aetiology and timings of these near miss events were analyzed. Of the 35 maternal near miss cases with an incidence ratio of 7.5 per 1000 live births, obstetric hemorrhage was the most common cause of near miss events accounting for (57%), followed by hypertensive disorders of pregnancy (17%), cardiac disease in pregnancy (11.4%), sepsis (8.5%) and indirect causes (2.8%). 40% of the near miss events occurred in the post-partum period followed by 1st trimester of 28.5%. The 3rd trimester had 20% cases, 8.5% in 2nd trimester and 2.8% during the intra partum period. An awareness of near miss events helps us to know its leading causes, take appropriate preventive measures and decrease maternal morbidity and mortality.

Keywords: Maternal near miss, pregnancy, maternal mortality, post-partum

Introduction

Near miss is defined as very ill pregnant or recently delivered woman who nearly died but survived a complication during pregnancy, childbirth or within 42 days of termination of pregnancy [1]. Knowing the causes for the maternal death and analysing the modes of treatment which followed to save the life of pregnant women is an important tool which constitutes the maternal near miss cases.

The World Health Organization (WHO) proposes a maternal near miss approach to monitor and improve obstetric care. Globally much attention has been directed in reducing the mortality rate. Near miss audits have become a part of an ongoing monitoring system. In 2009, WHO has come up with clinical laboratory, and management criteria for the identification of these cases [2]. Most of the obstetrical complications can be prevented or managed provided a timely and properly taken intervention is ensured to the patient.

Near miss cases share many characteristics with maternal death and can directly inform obstacles that have to be overcome after the onset of an acute complication. Corrective actions for identified problems can be taken to reduce mortality and long term morbidity [3]. Over the last decade, identification of cases of severe maternal morbidity has emerged as a promising complement or alternative to the investigation of maternal death.

The causes of near miss vary in different geographical areas of the world and also there are variations within countries. Hemorrhage, hypertensive disorders, sepsis and obstructed labor are the most important causes in the developing countries. Hemorrhage was the leading cause of maternal deaths in Africa (33.9%) and in Asia (30.8%) while in Latin America and the Caribbean, hypertensive disorders were responsible for 25% deaths. Anemia was reported as an important cause in 12.8% deaths in Asia, 3.7% in Africa and none in the developed countries [4, 5]. Our study aims to determine the frequency of maternal near miss expressing it as a maternal near miss incidence ratio and also to know the aetiology of these near miss events.

Materials and Methods

This prospective observational study was done at a tertiary care institute from June 2017-May 2019. The data was collected from obstetric emergency patients as per criteria defined by WHO.

The following criteria were included in the present study ie. Clinical, laboratory & management criteria

1. **Based on Disease Specific Criteria:** Severe post-partum hemorrhage (PPH), rupture uterus and eclampsia, sepsis and severe systemic infection.
2. **Critical Interventions:** Intensive care unit (ICU) management, admission to an ICU unit, interventional radiology, laparotomy (Hysterectomy excludes caesarean section) & use of blood products.
3. **Life Threatening Conditions:** Dysfunctions of

Cardiovascular (CVS), respiratory, hepatic, neurological, renal & coagulation dysfunction: like coagulation failure, maximum transfusion >5 Units and severe acute thrombocytopenia >50,000 platelet count [1].

Patients with conditions unrelated to pregnancy were excluded from the study.

Results

Table 1: A table showing near miss numbers and causes

Causes	Number	Near miss/1000 live births
Hypertensive disorders of pregnancy	6	1.3
Severe pre-eclampsia	4	-
Eclampsia	2	-
Severe obstetric hemorrhage	20	4.3
Early pregnancy	1	-
Ectopic	9	-
Abortion 2nd trimester	1	-
Antepartum hemorrhage	1	-
Post partum hemorrhage	8	-
Sepsis	3	0.6
Cardiac causes	4	0.9
Indirect causes	1	0.2
Total	35	7.5

The number of live births during the study period was 4658. During this study period there were 35 maternal near miss cases with an incidence ratio of 7.5 per 1000 live births. Obstetric hemorrhage was the most common cause of near miss events accounting for (57% n=20) of near miss events, followed by hypertensive disorders of pregnancy (17% n=6), cardiac disease in pregnancy (11.4% n=4), sepsis (8.5% n=3) and indirect causes (2.8% n=1).

The most common cause of obstetric haemorrhage was a ruptured ectopic (n=9), followed by post partum hemorrhage (n=8), antepartum hemorrhage (n=1) due to bleeding placenta previa, second trimester abortion (n=1) due to hypothyroidism developing severe anaemia, and molar pregnancy with ruptured theca lutein cysts (n=1) requiring laprotomy as depicted in Table: 1.

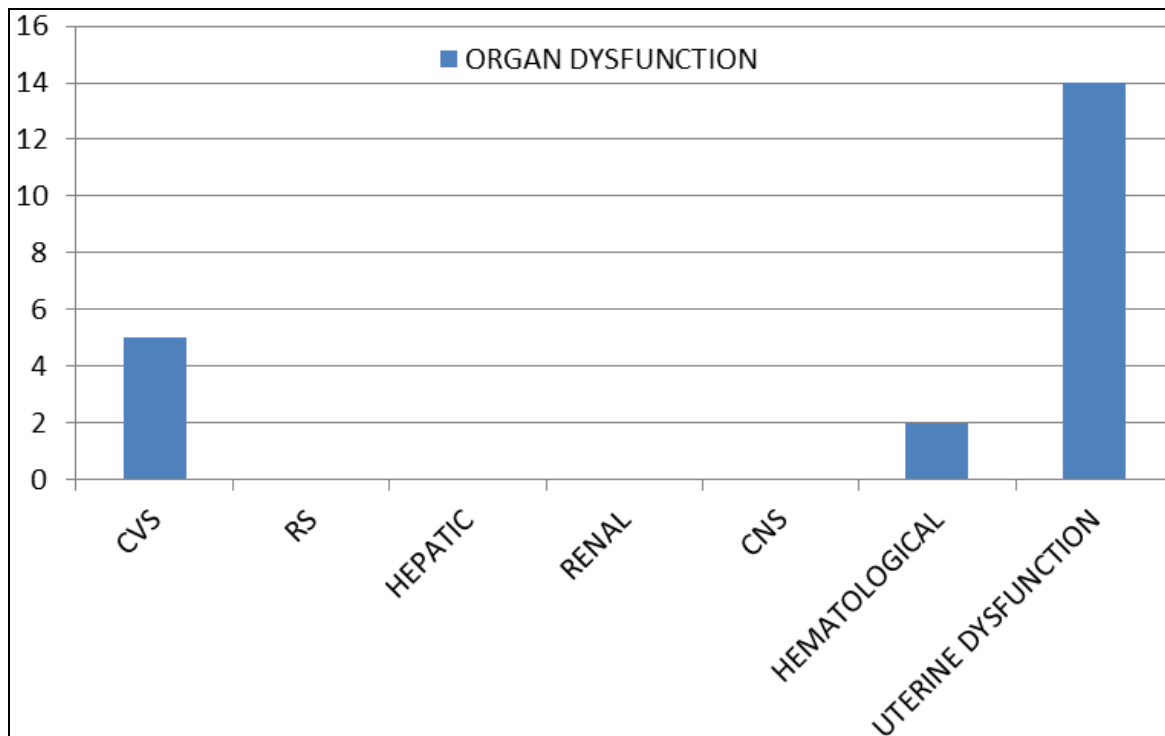


Fig 1: Bar diagram showing organ dysfunction of near miss events

The uterine dysfunction (40% n=14) was the most common followed by cardiovascular system (14.2% n=5) and haematological (5.7% n=2) as seen in Fig: 1.

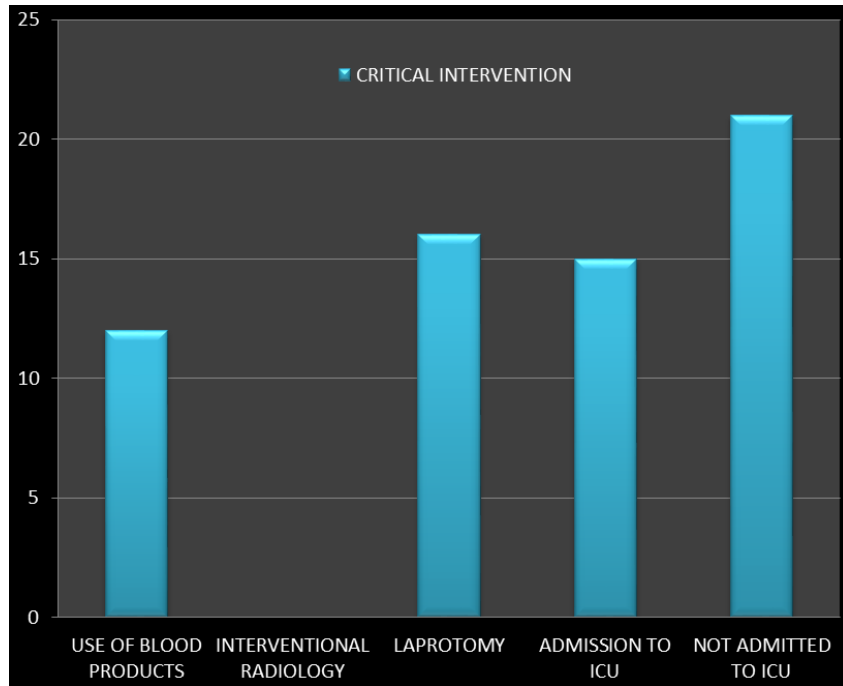


Fig 2: Bar chart showing critical interventions of near miss events

Fig: 2 depicts 45.6% (n=16) of the cases required emergency laprotomy as a critical intervention of near miss event of which 9 were because of ectopic pregnancy requiring emergency intervention, 3 were due the sepsis, 1 developed HELLP in 2nd trimester and proceeded to hysterotomy, 1 was due to sub rectal hematoma requiring a reopen laprotomy, 1 case had post-partum haemorrhage post LSCS and proceeded for laprotomy and hysterectomy and 1 was post molar evacuation with theca leutin cyst with torsion and rupture requiring laprotomy. 42% (n=15) required ICU care and an average duration of stay in ICU was 5 to 7 days. 35% (n=12) of them required transfusion of blood and blood products.

Table 2: A table showing timing of near miss events

Timing of near miss	Number
1 st trimester	10
2 nd trimester	3
3 rd trimester	7
Intra-partum	1
Post-partum	14

40% of near miss events occurred in the post-partum period as shown in Table 2 that was followed by 1st trimester of 28.5%. 20% occurred in third trimester, 8.5% in 2nd trimester and 2.8% intrapartum.

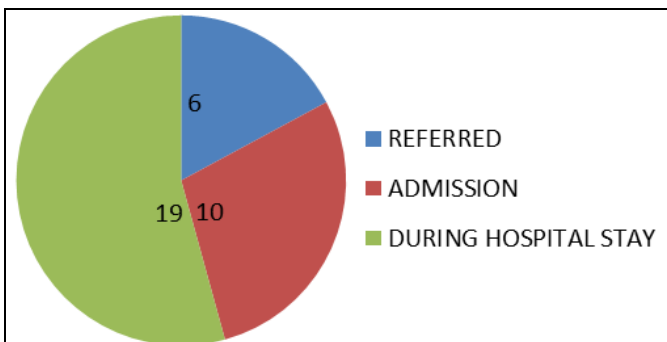


Fig 3: A PIE chart showing the registration status at the time of near miss.

54% (n=19) of them developed a near miss event during their stay in the hospital, 46% (n=16) presented as a near miss at the time of admission of which 6 were referred from other centers as shown in Fig: 3.

Discussion

The WHO near miss maternal audit tool was used in our present study to define near miss cases and calculate rates and ratios. The WHO criteria for pregnancy related life threatening conditions are a part of strategy promoted by WHO for assessing and improving quality of maternal health care [6-8].

A study by Roopa *et al.* [9] in Manipal in India represents near miss data from developing countries with a maternal near-miss incidence ratio was 17.8/1000 live births. Amongst the leading causes in her study of near-miss were severe haemorrhage, hypertensive disorders of pregnancy and sepsis, which is similar to the findings in our study. They had used the WHO 2009 inclusion criteria for the near-miss cases.

A study by Rathod *et al.* [10] in Yavathmal also was done to assess near miss from developing countries, where the study showed a maternal near-miss incidence ratio is 7.56 per 1000 live births. Amongst the leading causes they identified were severe hemorrhage, anaemia, hepatitis and hypertensive disorders of pregnancy. The leading cause being obstetric hemorrhage which was similar to our present study.

Our study also showed obstetric hemorrhage was followed by hypertensive disorders of pregnancy as a leading cause of near miss events. 46% of the cases presented as near miss at the time of admission. This shows there is a delay in the referral system and a lack of awareness among the public. Thus necessary measures have to be taken to manage the referral system efficiently to handle the near miss events. Training of multipurpose health workers, accredited social health activist (ASHA), auxiliary nurse midwife’s (ANM) working at sub-centres of primary health care (PHC) and rural hospitals regarding warning signs and symptoms of pregnant women and diagnosis of conditions, identification of high-risk cases, and timely and fast referral of high-risk patients for higher institutional care delivery can prevent near-miss events and reduce maternal mortality.

Conclusions

Training and awareness of health workers in the community centres can prevent near miss events from the existing referral system and help them take appropriate preventive measures and decrease maternal morbidity and mortality.

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