MATERNAL NEAR MISS OBSTETRIC EVENTS IN A TERTIARY CARE HOSPITAL

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Abstract

Background: Maternal death in pregnancy may not reflect the scale of acute morbidities associated with pregnancy and childbirth. Studying cases of women who survived a severe complication in pregnancy, childbirth on the post partum period (Maternal near miss) is increasingly being recognized as potentially more useful then studying maternal mortality in terms of assessing healthcare needs. To determine the causes of maternal near miss. Maternal Near Miss incidence ratio. Maternal near miss to mortality ratio and mortality index.

Materials and methods : A prospective cross sectional study was performed from January 2015- December 2015 at a tertiary care hospital in Chattogram. All women admitted to study facilities with pregnancy related complications or for birth. An adopted version of the WHO Maternal Near Miss Screening Tools was used to identify Maternal Near Miss cases. Incidence of maternal near miss, Maternal Near Miss to maternal mortality ratio and causes of and factors associated with Maternal Near Miss.

Results : There were 3089 deliveries, 90 near miss cases during the study period. The maternal near miss incidence ratio was 31.4/1000 live births, maternal near miss to mortality ratio was 5:1 and mortality index was 16.7%. Eclampsia (35.6%) was the leading causes of near miss, followed by haemorrhage (23.3%) and ruptured uterus (11.1%).

Conclusion : The Near Miss rate was high. Contributing factors were lack of resources, low quality of primary health care and delays in care. All Near Miss should be accepted as opportunities to improve the quality of maternity care. Health sector should address delays in conducting intervention, referral barriers and fully equipped intensive care units must be created in all facilities.

Introduction

Maternal death in pregnancy may not reflect the scale of acute morbidities associated with pregnancy and childbirth[1]. Studying cases of women who survived a severe complication in pregnancy, childbirth on the post partum period (Maternal near miss) is increasingly being recognized as potentially more useful then studying maternal mortality in terms of assessing healthcare needs. This concept was defined by the WHO, which aims to facilitate reviews of these cases to monitor and improve the quality of obstetric care[2].

Identification criteria for Maternal Near Misses were mainly divided into three areas- disease based, management based and organ dysfunction based criteria.

A Maternal Near Miss defined by WHO as a women who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy. The inclusion criteria for a Maternal Near Miss are categorized in three areas:- Clinical criteria, Laboratory based criteria and management based criteria.

The development of the Near Miss criteria resulted in 2011 in the WHO Near Miss approach. This is a guideline for evaluating the quality of care for severe pregnancy complication.

Cases of near miss occur in large number then maternal deaths. It has been estimated that up to 9 million women survive obstetric complication every year and the consequences of these may be permanent and wide reaching[3].

Chittagong Medical College Hospital is a government hospital, located in the centre of the Chattogram district. It is the only tertiary hospital in Chattogram district. Here the MMR is always

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more than the national level because it is the only tertiary care hospital for 76,16,352 (According to district statistics 2011 by BBS) people in Chattogram.

In our study we aimed to determine the frequency of Maternal Near Miss (MNM) incidence ratio (MNRM), maternal near miss to mortality ratio and mortality index. Our second objective was to analyze the causes of maternal near miss morbidity and mortality.

Material and methods

This was prospective cross-sectional study in which cases of maternal near miss were identified among women who were admitted to unit 1 of Gynaecology and Obstetrics ward of Chittagong Medical College Hospital (CMCH) from January 2015 to December 2015.

In addition to providing twenty four hour emergency obstetric services, the hospital also provides antenatal care and delivery services for both low and high risk pregnancy women. Hospital has 24hour facility for blood component thereby High dependency unit in labour room complex and Intensive Care (ICU) with 24 hour facility for multidisciplinary specialty also functioning well.

All maternal deaths and maternal near misses that were admitted to CMCH were prospectively included in the study during the above-mentioned period. Cases which met WHO 2009 criteria for near miss were selected. Maternal mortality during the same period was also analyzed. Patients were categorized by final diagnosis with respect to haemorrhage, hypertensive disorder of pregnancy, postpartum sepsis, septic abortion, obstructed labour, rupture uterus and other medical disorders were considered as indirect causes contributing to maternal near miss and death.

The following near miss indices were calculated-
i) Maternal Near Miss Incidence Ratio (MNM IR) refers to the maternal near miss cases per 1000 Live Births (LB).

MNM IR= MNM/LB

ii) Maternal near miss mortality ratio: Proportion between maternal near miss cases and maternal deaths. Higher ratio indicated better case. MNM: IMD

III) Mortality Index (MI): Number of maternal deaths divided by the number of women with life threatening conditions, expressed as a percentage. The higher the index more women with life threatening condition die (Low quality of care) while low index suggests better quality of health care.

$MI = MD/(MNM+MD)100$

Inclusion criteria

All maternal death and Maternal Near Miss were prospectively included in the study during the above mentioned period. For the identification of Maternal Near Misses, we intended to use the WHO Near Miss criteria. All clinical criteria could be applied in our group. In the group of laboratory based criteria only oxygen saturation and measurement of platelets, serum billirubin, serum creatinine, could be used. In the category, management based criteria- intubation & ventilation, cardiopulmonary resuscitation and continuous vasoactive drugs and & transfusion of 3-4 unit of blood and renal dialysis were included.

Results

In the one year study period 108 women with life threatening conditions were included in the study, among them 90 maternal near miss cases and 18 maternal deaths. In the study period 3089 deliveries and 2870 live births occurred at CMCH. Table I shows the characteristics of women with their near miss and mortality.

Among women classified as near miss, the mean age was (25.4±5.95 years) 52.2% were primigravida and 46.3% of the deliveries were performed by cesarean section. A total of 108 potentially life threatening conditions were identified of which 90 were near miss cases. Maternal near miss incidence ratio is 31.4/1000 live births, Maternal near miss to mortality ratio is 5:1, The mortality index is16.7%. A total of 2.2 % of the cases required ICU admission.

Among the 90 cases of near miss, eclampsia was the leading cause with 35.6% cases and hemorrhage were 23.3%. Eclampsia was also the main cause of maternal death with 38.9% cases. Table 2 shows the causes of maternal near miss and maternal mortality.

Table I : Characteristics of near miss cases and maternal deaths.

Characteristics	Near Miss, n=99(%)	Maternal Deaths, n=18(%)
Age (Years)	25.4±5.95(SD)	24.56±3.91(SD)
Parity		
Primipara	47(52.22)	7(38.89)
Multipara	43(47.78)	11(61.11)
Gestational age (Weeks)		
1-12	7(7.78)	2(11.11)
13-28	10(11.11)	1(5.56)
>28	64(71.11)	8(44.44)
Postnatal	9(10.00)	7(38.89)

Table II : Causes of maternal near miss and maternal deaths.

Causes	Maternal Near Miss (n=90)		Maternal Mortality (n=18)	
	No.	%	No.	%
Haemorhage				
Antepartum	21	23.3	3	16.7
	9	10.0		
Postpartum	7	7.8	3	16.7
Ectopic Pregnancy	5	5.5		
Hypertensive Disorders of Pregnancy	33	36.7	7	38.9
Preeclampsia	1	1.1		
Eclampsia				
	32	35.6	7	38.9
Postpartam Sepsis				
	3	3.3	1	5.6
Obstructed Labour	7	7.8	3	16.7
Septic Abortion	9	10.0	3	16.7
Ruptured Uterus				
	10	11.1		
Morbid Adhesion of Placenta				
	3	3.3		
Indirect Causes	4	4.4	1	5.6
Renal Failure	2	2.2		
Heart disease	1	1.1	1	5.6
Carcinoma	1	1.1		

Discussion

This article presents the results of a prospective cross sectional study. Obstetric deaths represent the quality of maternal care. But for the present scenario it may not reflect the global situation with regards to obstetric care. Hence new 'Near Miss' criteria take over maternal mortality ratio.

A study by Jayarathram et al represents near miss from a developed country showed that preeclampsia, PPH, sepsis are the major causes[4]. In comparison, haemorrhage was the same, but near miss ratio is almost three times more in our study, obviously differentiating the developing country from developed country. Our study results were comparable to the studies of other developing countries. The maternal near miss incidence ratio was 31.4/1000 live births in our hospital. Studies done in the developing countries show the same trend and vary from anywhere between 15-40/1000 live births[5,6]. This variation may be due to use various criteria for identification of cases.

In our study, eclampsia was the leading cause of maternal death. haemorrhage, obstructed labour and septic abortion were the second leading cause. Study in other developing countries shows haemorrhage is still the major cause.

The near miss to mortality ratio 5:1, which for every life threatening conditions there was one maternal death. Higher ratios indicate better care. A study in Nepal showed a ratio of 7.2:1and 60:1 in a study un Syria[7,8]. This ratio is similar to those of African country where the range is 5-12:1[9]. But studies in Western Europe have reported a ratio of 117-223:1[6]. Increase in the ratio reflects on the improvement achieved in obstetric care.

The improvement lie in the evidence based intervention as suggested by Campbell et al. "We should get on with what works" in order to reduce maternal mortality[10,11]. Implementation of evidence based practice such as active management of third stage of labour, use of MgSO4 in severe preeclampsia and eclampsia, prophylactic antibiotic in caesarean section care, use of balloon temponade in PPH reduces the maternal mortality.

Ours is a tertiary referral center covering Chattogram district, with most cases being referred in an already moribund state. The delays in referrals are a major cause of maternal near miss and maternal mortality. So, referral system should be improved to reduce this morbidity and mortality. Along with increased awareness of one's own health, health education may go a long way in improving the quality of obstetric care.

There were several limitations to this study. First this was single centre and hospital based study and therefore findings may not reflect the real situation in other settings or the population in general. ICU facilities were available few potentially life threatening conditions before going on to near miss might have been selected. For the collection of near miss cases we have used modified WHO near miss criteria, as the original WHO near miss criteria were not applicable in the local context.

Limitation

In thin surveillance there was no measure of performance on specific and recommended standard practices in the management of complicated cases due to limited facilities of ICU & HDU bed.

Conclusion

The present study shows that eclampsia and haemorrhage are the leading causes of near miss and

maternal mortality. Prompt and proper management of eclampsia and hemorrhage will be a significant strategy in reduction of maternal near miss and mortality. Near miss is five times higher than maternal death. As near miss analysis indicates quality of obstetric health care, it is worth presenting in national indices.

Recommendation
The most common preventable causes of MNM and death were lack of patient education/ understanding of obstetric emergencies & shortage of medical supplies. So we should create the mass awareness of obstetric emergencies and should increase the availabilities of emergency services.

Contribution of author
SD - Conception, design, cquisition of data, manuscript writing & final approval.
BRC - Data analysis, manuscript writing & final approval.

RB - Interpretation of data, critical revision & final approval.

Disclosure
All the authors declared no competing interest.

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