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MATERNAL NEAR MISS AND MATERNAL DEATHS IN KERALA, INDIA - A REVIEW

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ABSTRACT

Aim- To determine the prevalence and pattern of near miss cases/ severe acute maternal morbidity cases and maternal deaths in a tertiary centre.

Materials and methods - WHO 2011 criteria was used for identification of near miss cases. Results- In the study period of 2 years, there were 131 cases of severe maternal outcome (105 near miss and 26 maternal deaths). Maternal near miss incidence ratio is 5.62/ 1000 live births. Maternal near miss to mortality ratio is 4.03:1. The mortality index is 19.8%. Hemorrhage was the leading cause of near miss cases (44.76%) followed by hypertension(27.6%) but indirect causes(42.3%) led to maximum number of maternal deaths followed by hemorrhage. Among the indirect causes, cardiac and neurological disorder caused maximum mortality.

Conclusion - Hemorrhage and hypertension were the leading causes of near miss but maternal mortality was more due to indirect causes. So it's important to involve specialist doctors from other departments to improve care of mothers and hence reduce maternal deaths further.

KEYWORDS : SAMM, WHO criteria, mortality index

INTRODUCTION

Approximately 830 women die every day from preventable causes related to pregnancy and child birth (1). The global effort of reducing maternal mortality by 75 % by 2015 from 1990 level, which was the goal number 5 in the millennium development goals, has helped in making a progress towards reducing maternal mortality. As a part of sustainable development, WHO has set a target is to reduce the global maternal mortality ratio to less than 70 /100,000 live births between 2016 and 2030(1).

Health status of pregnant women was reflected by mortality indicators but women who survive severe complications during pregnancy, childbirth and postpartum period could help us in better understanding of the conditions and preventable factors that contribute to maternal death. Hence the concept of maternal near miss was introduced. A maternal near miss event is currently defined by WHO as' a woman who nearly died but survived a complication that occurred during pregnancy, child birth or within 42 days of termination of pregnancy' (2, 3,4).

In 2008, WHO came with a standard definition for severe acute maternal morbidity that includes clinical, laboratory and intervention based criteria (5). In 2011, WHO revised this criterion and comes with a new concept to identify near miss cases that includes mainly five severe maternal complications and life threatening conditions associated with them (2).

Sree Avittom Thirunal hospital is the maternal and child facility attached to Government Medical College, Trivandrum, Kerala, India which is the major referral tertiary centre in southern part of Kerala. Hence this study was done to determine the prevalence and pattern of near miss and maternal deaths in our tertiary referral hospital and to assess the quality of health care.

MATERIALS AND METHODS

Aim: - To determine the prevalence and pattern of near miss cases/ severe acute maternal morbidity cases and maternal deaths in a tertiary centre.

Study design: Retrospective Cross sectional facility based study

Study setting: - Department of obstetrics and gynecology, Sree Avittom Thirunal Hospital, Government Medical College, Trivandrum, Kerala, India, a referral hospital managing cases from 100 Km surrounding the hospital

Study population: - All antenatal and postnatal patients within 42 days of delivery who were managed in the hospital.

Study period: – 2 years.

Inclusion criteria:- WHO 2011 criteria was used for identification of near miss cases that included mainly five severe maternal complications and life threatening conditions associated with them .

These five maternal complications are:

1. Severe postpartum hemorrhage
2. Severe preeclampsia and Eclampsia
3. Sepsis or severe systemic infections
4. Rupture uterus
5. Severe complications of abortion

Maternal mortality in the same period was also analyzed.

Eligibility is not restricted by gestational age at which complications occurs.

Exclusion criteria: - morbidity from accidental or incidental causes like accidents were not included in the study.

Data analysis: - Data was collected using structured Performa collected by interviewing the patient or from case sheets and entered in Microsoft excel and the near miss indices were calculated. Before the interview informed consent was taken.

1. Maternal near miss incidence ratio refers to the number of maternal near miss per 1000 live births
2. Maternal near miss : mortality ratio
3. Mortality index: number of maternal deaths divided by number of women with life threatening conditions expressed as percentage. (MI= MD/MD+MNM)×100.

RESULTS

During the period of 2 years, there were 18837 deliveries and 18653 live births. According to WHO 2009 criteria, 131 cases of severe maternal outcome were identified out of which there were 105 near miss and 26 maternal deaths.

Table I

Demographic and obstetric characteristics of near miss and maternal deaths

Demographic and obstetric		
Characteristics (n=26) %	near miss (n =105) %	maternal deaths
Age of the woman		
<20	3(2.8)	1(3.84)
20-29	66(62.85)	19(73.07)
30-39	35(33.33)	5 (19.23)
>40	1(0.95)	1(3.84)
Parity		
Primigravida	50(47.6)	13(50)
Multigravida	55(52.4)	13(50)
Gestational age of presentation		
1-12wks	11(10.47)	1(3.84)
13-28wks	1(0.09)	6(23.07)
28-36 wks	30(28.57)	7(26.9)

>36wks	41(39.04)	7(26.9)
Postnatal	22(20.95)	5(19.23)
Booking status		
Booked	25(23.8)	5(19.23)
Secondary care	65(61.9)	15(57.6)
Private sector hospitals	15(14.2)	6(23.07)
Causes		
Hemorrhage	47(44.76)	6(23.07)
Hypertension	29(27.6)	2(7.69)
Sepsis	2(1.9)	3(11.53)
AFLP	4(3.8)	1(3.8)
Ectopic	10(9.52)	0
Indirect	13(12.38)	11(42.3)
MTP	0	1 (3.8)
Suicide	-	2(7.69)
Pregnancy outcomes		
Abortion	01(6.6)	1(3.86)
Live birth	68(64.76)	17(65.38)
Stillbirth	10(9.5)	6(23.07)
Neonatal death	16(15.2)	0
Ectopic	10 (9.5)	0
Antepartum	0	2(7.69)

Maximum number of near miss and maternal death were in the age group of 20- 29years. Near miss cases were slightly more in multigravida. Most of the patients were in the third trimester in the near miss category while maternal deaths were not confined to any particular gestational age. Most of the cases of near miss and maternal deaths were referred from other institutions especially secondary care centers. Most of the near miss cases and maternal deaths had live births.

Maternal near miss incidence ratio is 5.62/ 1000live births. Maternal near miss to mortality ratio is 4.03:1. The mortality index is 19.8%. Hemorrhage was the leading cause of near miss cases (44.76%) followed by hypertension (27.6%) but indirect causes(42.3%) led to maximum number of maternal deaths followed by hemorrhage. Among the indirect causes, cardiac and neurological disorder caused maximum mortality.

Indirect causes of maternal deaths

Cardiac causes	4
Neurologica	l4
Hematologica	l2
Severe bronchial asthma with respiratory arrest	1

Comparison of causes of near miss cases and maternal deaths

Diagnosis index	near miss incidence ratio	mortality
Hemorrhage	0.25	11.32
Hypertensive disorders	0.15	6.45
Sepsis	0.01	6
Indirect causes		
1.Cardiac	0.02	
2.Neurological	0.02	45.8
3.Hematological	0.01	

DISCUSSION

Obstetric deaths may not reflect the quality of obstetric care and hence near miss cases are also considered for quality assessment. The study was conducted for a period of 2years and there were 18837 deliveries, 18653 live births, 105 near miss and 26 maternal deaths.96.1% of near miss cases and 92.2 % of the maternal deaths were in the age group of 20-29 years. This must be because 77.9 % of the women who delivered in our hospital were in this age group. This was similar to the study done in Manipal, India and in Kerala (6, 7).In our study, the near miss or mortality cases were not influenced by parity of the women. Both near miss and mortality cases were more in the third trimester which was similar to another study done in Kerala, India(7). 76.1 % of the near miss case and 80% of the maternal deaths were referred from other hospitals.

The maternal near miss incidence ratio was 5.62 / 1000 live births in our study. Our finding was lower than the studies done in India which ranged from 3.98 to 17.38 / 1000 live births and may be due to different criteria used by the previous studies. This was similar to study done in Thrissur district, Kerala where the ratio was 9.27/ 1000 live births and in Ethiopia where the maternal near miss incidence ratio was 8.01 per 1000 live births (7, 8). The maternal near miss incidence ratio in high income countries was between 3-12 per 1000 births but was between 15 -40 per 1000 live births in developing countries.(9,10,11). . Maternal near miss to mortality ratio is 4.03:1. This was similar to the study done in Manipal, India which had a ratio of 5.6:1(6). It means that for every 4 women who were saved, one woman died. Higher ratios indicate better care. Syrian study showed a ratio of 60: 1 and study done in Nepal showed a ratio of 7.2: 1 (12, 13). This ratio is similar to those of African country where the range is 1: 5–12 (14). This is a far cry from those reported in Western Europe. Their studies have reported a ratio of 117–223: 1 (9).

Maternal mortality ratio in our hospital is 139/ 100,000 live births, even though MMR in Kerala is 46/ one lakh. This must be because our hospital is strictly a referral centre which caters patients 100 Km surrounding the hospital. Studies done in India and other developing countries showed a higher mortality rate varying between 260 – 423 / 100,000 live births (10, 12, 13). Even though, hemorrhage was the most common cause of near miss cases, it was possible for us to save most of the patients, except those who were critically unwell that they could not be revived or brought dead to the hospital. The major causes of mortality were indirect causes due to cardiac diseases and neurological diseases in our study. The most common cause of maternal mortality is still hemorrhage in India (15). But in our study, indirect causes mainly cardiac and neurological causes led to maternal mortality. It was possible to save all women who had ectopic pregnancies which were ruptured.

CONCLUSION

Maternal mortality and morbidity are sensitive indicators of standard care. Hemorrhage and hypertension were the leading causes of near miss but maternal mortality was more due to indirect causes. So it's important to involve specialist doctors from other departments to improve care of mothers and hence reduce maternal deaths further.

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