

Evaluation of Maternal Near Miss Cases at a Tertiary Care Hospital at Amritsar

Pumma Mehak*, Kaur Amrit Pal**, Chatrath Veena***

* Postgraduate student, Deptt. Of Obstetrics and Gynaecology, GMC Amritsar

** Professor, Deptt. Of Obstetrics and Gynaecology, GMC Amritsar

*** Professor and head, Deptt. Of Anaesthesia and Critical care, GMC Amritsar

Abstract- Maternal mortality has always been an indicator of health status of a country. Though MMR has decreased in India, it has still not achieved target required by MDG 2015.¹ Near miss is a serious adverse event that leads to morbidity in the mother, but from which she survives. This term has the advantage over maternal death of drawing attention to surviving women's reproductive health and lives and is equally applicable in developing as well as developed countries. This was a prospective observational study conducted at a tertiary care institute- Bebe Nanki Mother and Child Care Centre, GMC Amritsar, Punjab from January 2016 to June 2017. Of the 10,747 obstetric admissions during study period, 9975 deliveries were conducted with 9717 live births. As per WHO criteria based on primary near miss event and organ system involvement, 158 cases were included for the study. There were 92 maternal deaths during the study period. Near miss incidence ratio was 16.26 per 1000 live births. Maternal near miss to mortality ratio was 1.72:1. Mortality index was 36.8%. Haemorrhage was the leading cause of maternal near miss in 44.94% patients. Most common organ system involved was cardiovascular system which was involved in 68.35%.

I. INTRODUCTION

Maternal mortality is a result of a complex interaction between medical, cultural, logistic and socioeconomic factors and the prevailing healthcare infrastructure in the community. Maternal death and its rate in a year is an important indicator of healthcare in a country. Death of the mother during childbirth hits the backbone of the family. Family as a unit is shattered with maternal death.

India contributes to 16% of the world's population and accounts for over 18% of the maternal deaths in the world.² The term near miss used is thought of as a case where a woman had near brush with death and with intensive medical intervention, death was avoided and turned into a survival. This term is increasingly replaced by Severe Acute Maternal Morbidity (SAMM) which refers to the morbidity a woman actually suffers.³ The WHO has recommended investigating near miss cases as a benchmark practice for monitoring health.

Objectives

To determine the level of near miss morbidity due to severe obstetrical complications at our tertiary care hospital and to determine the most common causes of near miss in our centre.

II. MATERIALS AND METHODS

This was a prospective observational study conducted at a Tertiary Care Institute- Bebe Nanki Mother and Child Care Centre, GMC Amritsar from January 2016 to June 2017. Serving as a referral centre for both Public and Private hospitals in Amritsar and nearby districts of Punjab, institute has approximately 7000 antenatal admission per year with provision of antenatal care and delivery services for both high and low risk patients.

Of the 10,747 Obstetric admissions during study period, 9975 deliveries were conducted with 9717 live births. As per WHO criteria based on primary near miss event and organ system involvement, 158 cases were included for the study. There were 92 maternal deaths during the study period. Cases were identified and followed up throughout their period of hospital stay.

- Patients were identified at the time of admission and were followed up till their discharge. WHO criteria for near miss⁴(2009) was used to identify the near miss cases. The WHO criteria identifies near miss cases based on three approaches: disease specific criteria, management based criteria and organ dysfunction based criteria. In our study organ dysfunction based criteria was used to identify the near miss case. Following indices were calculated.⁵
- Maternal Near Miss incidence ratio: number of near miss cases per 1000 live births.
- Maternal near miss to Mortality ratio: Proportion between maternal near miss cases and maternal deaths. Higher ratio indicates better care.
- Mortality index: Number of maternal deaths divided by number of women with life threatening conditions expressed as a percentage.

III. RESULTS

Total 158 maternal near miss cases admitted during the study period were evaluated for various parameters. Most of the patients, 70(44.30%), were between age group of 20-25 years. 91 patients(57.59%) were multigravida. Majority of the patients, 112(70.89%) presented to our centre during antenatal period,

while the rest delivered at other centres and were referred for management of postpartum complications. Majority of the patients presenting at our centre were unbooked 143(90.50%) . This clearly emphasizes the importance of booking and regular antenatal checkups.

TABLE I

Parameters studied	Results (n=158)
Most common age group	20-25 years 44.30%(n=70)
Parity	Multigravida 57.59%(n=91)
Booking status	Unbooked 90.50% (n=143)
Referral	Referred 83.54%(n=132)
Referral centre	Civil hospitals 46.21%(n=61)
Mode of transport	108 ambulance 73.42% (n=116)

Haemorrhage was found to be the leading cause involved in maternal near miss, presenting complaint in 71(44.94%) followed by Hypertensive disorders of pregnancy in 34(21.52%), rupture uterus in 18(11.39%).

Causes of haemorrhage: Haemorrhage was the cause of morbidity was the in 71 patients(44.94%) which included PPH, APH, Placenta Accreta, Ruptured Ectopic.

**TABLE II
CAUSES OF HAEMORRHAGE**

Haemorrhage	No.of patients	Percentage
PPH	32	45.07%
APH	7	9.86%
Placenta accrete	23	32.39%
Ruptured ectopic	9	12.68%
Total	71	

Our study identified the patients based on WHO organ system criteria, many patients had more than 1 system involved so all the organ systems involved were taken into consideration while classifying the patients based on organ system involvement. These patients could not be classified into water-tight categories, so cumulative incidence of organ system dysfunction was calculated.

Among our 158 near miss cases, 108 patients(68.35%) had cardiovascular system dysfunction followed by respiratory dysfunction in 59 (37.34%) coagulation abnormality in 58 (36.71%), uterine dysfunction in 42 (26.58%), neurological dysfunction in 17 (10.76%), hepatic dysfunction in 15 (9.49%) and renal dysfunction in 12 patients (7.59%).

**TABLE III
ORGAN SYSTEM INVOLVEMENT**

Organ system involved	No. of patients	Percentage of total
Cardiovascular system	108	68.35%
Respiratory system	59	37.34%

Coagulation	58	36.71%
Uterine	31	19.62%
Neurological	17	10.76%
Hepatic	15	9.49%
Renal	12	7.59%

Of 158 patients, 46 patients came in post partum period, but their mode of delivery was taken into account. LSCS included caesarean hysterectomy and LSCS on dead baby also. 15 patients (9.49%) presented before the period of viability resulting in abortion, 66 (41.77%) underwent LSCS, 63 (39.87%) had NVD, 10(6.33%) had IUD vaginal delivery and 4 (2.53%) had vaginal birth after caesarean (VBAC).

**TABLE IV
MODE OF DELIVERY**

Mode of delivery	No. of patients	Percentage
Abortion	15	9.49
LSCS(inc. caesarean hysterectomy)	66	41.77
Normal vaginal delivery(NVD)	63	39.87
IUD Vaginal delivery (IUDVD)	10	6.33
Vaginal birth after caesarean(VBAC)	4	2.53
	158	100.0

Regarding the time of delivery, 15 patients (9.49%) presented before the period of viability,50 patients(31.65%) had preterm delivery, 62 patients(39.24%) had term delivery, 31 patients(19.62%) had Intrauterine death. Fetal outcome of 46 post natal patients was also recorded so as to know the outcome various morbidities on the pregnancy outcome.

**TABLE NO.V
MODE OF DELIVERY**

Fetal outcome	No.of patients	Percentage
Abortion	15	9.49
Alive preterm	50	31.65
Alive term	62	39.24
IUD	31	19.62
Total	158	

IV. DISCUSSION

Maternal near miss is defined as an event in which a pregnant or recently delivered woman survived a complication either during pregnancy, childbirth or 42 days after termination of pregnancy. For monitoring the level of obstetric healthcare, WHO recommends investigating near miss cases as a benchmark practice in addition to MMR. Maternal death audits form the mainstay of evaluation of maternal health services in developing countries where high level of maternal mortality has overshadowed severe obstetric morbidity.

Of the 10,747 obstetric admissions during study period, 9975 deliveries were conducted with 9717 live births. As per WHO criteria based on primary near miss event and organ system involvement, 158 cases were included for the study. There were 92 maternal deaths during the study period. Cases were identified and followed up throughout their period of hospital stay. 50% of the patients needed ICU intervention which highlights the importance of role of timely intervention and critical care.

In our study, most common age group involved was between 20-25 years. In similar study by Pandey et al,⁶ majority (88.3%) were between 18-35 years age whereas Singh Abha et al⁷ reported 21-30 years as the most common age group involved. Rathod et al⁸ have reported a mean age of 21.75 years in their study.

Postpartum patients presented to our centre with various complications. 29.11% patients were in postpartum period on presentation at our centre while in similar study by Parmar et al⁹ 19.5% patients were postpartum. Early marriage and multiple pregnancies coupled with anaemia and malnutrition increase the risk of various complications. Most common complication for referral in our study was PPH followed by eclampsia.

Significantly high rate of obstetric emergencies have been reported in multigravida in various studies which was also seen in our study with 91 (57.59%) cases of obstetric emergencies in multigravida as compared to 67 (42.41%) in primigravida.

Apart from anemia & multiple pregnancies, higher incidence of complications in multigravidas could be due to higher incidence of placenta praevia and accreta and higher incidence of rupture uterus in multigravida.

The commonest vehicle used for transportation was “108 ambulance” in 116 cases (73.42%). This demonstrates the role of “108 ambulance” in transporting of patients in our area. “108” is an emergency response system, operational in 21 states of India. Over the years it has greatly helped in transporting patients from rural areas to accessible healthcare centre.

The most common cause of maternal near miss in our study was haemorrhage ,On comparing our results with other studies, causes were found to be similar while hypertension was the leading cause in study by Singh Abha (2015) while Haemorrhage was leading cause in study by Rathod(2012).

TABLE VI

Studies	Rathod 2012	Singh Abha 2015	Present study2017
Near miss event	Haemorrhage (26.70%) Hypertension(11.80%) Anaemia (24.84%)	Haemorrhage (22.2%) Hypertension(38.8%) Severe anaemia (32%)	Haemorrhage (44%) Hypertension (21%) Rupture uterus (11%)

We had a higher rate of ICU admission than reported in other similar studies-49.37% in our study as compared to 26.70% reported by Rathod et al⁸. This could be attributed to the fact that most of the patients were brought in critical state/decompensated shock & needed ICU for stabilisation.

During the study period there were total 158 maternal near miss cases and 92 maternal deaths thus maternal near miss to mortality ratio was 1.72:1. Maternal near miss incidence ratio was 16.26 per 1000 live births. Mortality index was 36.8%. High mortality index indicate that more number of women with life threatening conditions die, in our study high mortality index was due to the fact that our centre is the only tertiary care referral centre in the region and most of the patients reached hospital in critical state, out of all the near miss cases only 21(13.9%) were stable .

V. CONCLUSION

Maternal health is the direct indicator of prevailing health status in a country. Although maternal deaths have reduced in significant number over the past years, maternal morbidity due to risk factors like Haemorrhage, Anaemia, PIH continue to affect the lives of pregnant women substantially. Our study was undertaken with an aim to find out the incidence of these near miss cases at our hospital. Near miss cases were found to be quite high in number as compared to maternal deaths. In our study ratio of near miss to maternal deaths was 1.72:1. Most

common cause of the near miss in our study was haemorrhage and most common cause of ICU admission was hypertension. Our study emphasizes that timely identification of high risk factors and their treatment and timely referral of high risk patients can play a major role in preventing maternal mortality and morbidity.

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Second Author – Dr. Amrit Pal Kaur, Professor, Deptt. Of Obstetrics and Gynaecology, GMC Amritsar

Third Author – Dr. Veena Chatrath, Professor and head, Deptt. Of Anaesthesia and Critical care, GMC Amritsar

Correspondence Author – Corresponding author: Dr. Mehak Pumma, Junior Resident, GMC Amritsar
Email mehak.pumma@gmail.com

AUTHORS

First Author – Dr. Mehak Pumma, Postgraduate student, Deptt. Of Obstetrics and Gynaecology, GMC Amritsar