Original research article

Analysis of "maternal near miss" cases in a tertiary care hospital, GGH, Srikakulam

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 Abstract

Aim: To study the analysis of "Maternal near miss" cases in a tertiary care hospital, GGH, Srikakulam.

Methodology: This prospective study is conducted in the Department of Obstetrics and Gynaecology of Government Medical College, Srikakulam from January 2022 to September 2023. The patients admitted in the antenatal ward, labour room and HICU were included in the study. WHO criteria were taken for identification of near miss cases.

Results: Maternal near-miss incidence ratio (total no of near-miss cases/total no. of live births X 1000) is 24.68. Maternal near-miss/maternal mortality ratio is 13.62. Mortality index (no. of maternal deaths /no of maternal deaths + no of near-miss cases) is 0.068. Maternal mortality rate is 181.16.The maternal near-miss to maternal mortality ratio and the mortality index tell about the quality of care given at a particular institute. The higher the maternal near-miss to maternal mortality ratio, the better is the care at the given institute. A lower mortality index signifies better care at the institute.

Conclusion: This study will give us an understanding of the leading causes of maternal mortality and the health seeking behaviour of the study population.

Keywords: Maternal cases, WHO criteria, mortality, live births

Introduction

Maternal mortality is one of the important indicators for the measurement of maternal health. Maternal deaths in absolute numbers are rare in a community. To overcome this challenge, maternal near miss has been suggested as a compliment to maternal death. GGH, Srikakulam is a tertiary care hospital where referrals are sent from several mandals and villages. High risk cases are referred with several complications.

Definition of near miss: A woman who survives a severe life-threatening condition (either after receiving emergency medical or surgical intervention or otherwise) during pregnancy, abortion, childbirth or within 42 days of pregnancy termination [1].

The prevalence of near miss is higher in developing countries and causes are similar to those of maternal mortality namely haemorrhage, hypertensive disorders, sepsis and obstructed labour.

Materials and Methods

This prospective study is conducted in the Department of Obstetrics and Gynaecology of Government Medical College, Srikakulam from January 2022 to September 2023. The patients admitted in the antenatal ward, labour room and HICU were included in the study. WHO criteria were taken for identification of near miss cases [3]. Clinical criteria related to specific disease entity, management specific criteria and the criteria based on organ dysfunction or failure are considered for classifying the cases. The causes and health seeking behaviour is identified in all cases.

Inclusion criteria
- Antenatal women admitted with MNMM.
- Postnatal women admitted with MNMM.
- Antenatal or postnatal women developing MNMM after admission.
- Referral cases with MNMM, referred from elsewhere.

Exclusion criteria
- Cases admitted with MNMM but resulted in mortality.
- Cases developing MNMM after admission but resulting in mortality.

Methodology
All cases admitted in the antenatal ward, labour room, Hybrid ICU and fulfilling the inclusion and exclusion criterias were taken into the study.

Whether they were near miss at arrival or became near miss after admission will be analysed. Near miss at arrival (within 3 to 6 hrs of admission) would reflect the effectiveness of the referral system. Patient stable, with no disorder on admission but becoming near miss later on would reflect the quality of care in the institution.

Among the patients who were stable on admission, the presence of obstetric risk factors like previous LSCS, placenta previa would be noted to see whether these contributed to the stable cases becoming near misses later on.

Potentially life-threatening conditions and maternal mortalities were noted from the records of the hospital after taking ethical clearance from the institute. Near-miss cases were noted based on the Health and Family Welfare Government of India guidelines 2014. Data were collected and statistical analysis was performed using the Statistical Package of the Social Sciences (SPSS) version 21 (IBM Corp., Armonk, NY).

Results
The present study was conducted in the Department of Obstetrics and Gynaecology, Government General Hospital, Srikakulam from January 2022 to September 2023. There were a total of 4536 deliveries during the study period. The number of live births is 4416. Out of which, there were 109 cases of near miss and 8 maternal deaths. Maternal near-miss incidence ratio (total no of near-miss cases/total no. of live births X 1000) is 24.68. Maternal near-miss/maternal mortality ratio is 13.62 Mortality index (no. of maternal deaths/no of maternal deaths + no of near-miss cases) is 0.068. Maternal mortality rate is 181.16.

The maternal near-miss to maternal mortality ratio and the mortality index tell about the quality of care given at a particular institute. The higher the maternal near-miss to maternal mortality ratio, the better is the care at the given institute. A lower mortality index signifies better care at the institute.

The near miss cases were taken based on WHO criteria which is shown in table 1.

Table 1: WHO criteria

S. No.	WHO criteria	No. of cases	Percentage
1.	RR>40 or <6	8	7.34
2.	Oliguria unresponsive to treatment	8	7.34
3.	Coagulation failure	2	1.83
4.	CVA	2	1.83
5.	Uncontrolled fits	7	6.42
6.	Jaundice with PE	12	11
7.	Spo2< 90% for >60min	12	11
8.	S. Creatinine >/= 3.5mg/dl	12	11
9.	S. Total Bilirubin >/= 6mg/dl	2	1.83
10.	Thrombocytopenia < 50,000	38	34.86
11.	Continuous vasoactive drugs	12	11
12.	Peripartum hysterectomy	16	14.68
13.	BT>/= 5 units	6	5.5
14.	Ventilation >60min, unrelated to anaesthesia	24	22.02
15.	Dialysis	8	7.34

The risk factors responsible for near miss cases and maternal deaths had similarities. Theserisk factors are shown in table 2.

Table 2: The risk factors responsible for near miss cases and maternal deaths had similarities

S. No.	Risk factors	No. of cases	Percentage
1.	Eclampsia	7	6.42
2.	Severe preeclampsia	43	39.45

3.	HELLP	12	11
4.	Abruption	18	16.51
5.	Ectopic	6	5.5
6.	Rupture uterus	4	3.67
7.	PAS	3	2.75
8.	PPH	15	13.76
9.	Sepsis	11	10.09
10.	Pneumonia	3	2.75
11.	Cardiac	12	11

The risk factors responsible for maternal deaths were similar to those of maternal near miss cases. Table 3 summarizes these risk factors.

Table 3: Risk Factors

S. No.	Risk factor	No. of cases	Percentage
1.	Hypertension	62	56.88
2.	Haemorrhage	46	42.2
3.	Infection	11	10.09
4.	Others	15	13.76

The analysis of the three delays in health care as done for maternal mortality was also done for the near miss cases and is shown in table 4.

Table 4: Delay cases

Delay	No. of cases	Percentage
I	85	77.98
II	14	12.84
III	9	8.26

The demographic factors responsible for the near miss cases are shown in table 5.

Table 5: Demographic factors

	<20	20
Age	21-35	76
	>35	13
Parity	Primi	68
	Multi	41
Booking status	Booked	22
	Unbooked	41
	<12 weeks	6
Gestational age	12-28 weeks	20
	>28 weeks	57
	Postnatal	26

Discussion

The present study conducted in a tertiary care centre identified the near miss cases in Obstetrics. The analysis of these cases is comparable to the mortality audit in the institute. WHO criteria were used to identify the near miss cases.

The maternal near-miss incidence ratio in the present study is 24.46 per 1000 live births A study by Bansal *et al.* [4] in Bastar, Chhattisgarh, in 2016 showed a maternal near-miss incidence ratio of 11.9/1000 live births, Another study by Jain [5] in 2019 in Shivpuri, Madhya Pradesh, shows an MNM incidence ratio of 14.3.

The different criteria for maternal near-miss (clinical, laboratory, and management) generally represent different levels of system or organ dysfunction and/or failure. Certain criteria like measurement of lactate levels, paO2/FiO2, blood pH levels were not obtained in majority of the cases and hence these criteria were not used in the present study. Near-miss cases share many characteristics with maternal deaths and can provide direct information about the obstacles that had to be overcome after the onset of an acute complication; hence, they provide valuable information on obstetrical care.

The study conducted at Ahmadabad by Mansuri *et al.* [6] and in Karnataka by Roopa *et al.* [7] also showed similarity in that most near-miss cases and mortality belonged to the third trimester of pregnancy.

In the present study, majority of the near miss cases were associated with hypertensive disorders of pregnancy (56.9%) The lack of death from severe pre-eclampsia/eclampsia may be attributed to better intrahospital care and appropriate interventions within an adequate timeframe, such as magnesium sulfate and timely interruption of the pregnancy.

which was similar to the study done by Jain in 2019 [5] and the study by Mansuri *et al.* [6] in Ahmadabad, Gujrat, in 2018, whereas the study by Bansal *et al.* [4] in 2016 and Roopa *et al.* [7] in 2013 showed hemorrhage as the most common SAMM followed by hypertensive disorders in pregnancy.

Hemorrhagic complications (mainly postpartum bleeding, uterine atony, and uterine rupture) had great potential for leading to near miss accounting for 42.2% of the cases. Of the cases of near-miss due to hemorrhage, the most important cause is postpartum haemorrhage. Thisfinding is consistent with the increasing trend currently found in developed countries [8].

The number of near-miss cases resulting from infectious causes (both obstetric and non-obstetric) was 10.09%.

This study is innovative in the sense that it applies the new WHO criteria for near-miss and uses indicators that may be helpful for monitoring the quality of obstetric care.

Conclusion

In health care literature NEAR MISS refers to a severe life-threatening condition that did not cause death-but had the potential to do so. A critically ill woman who would have died but for the good care received or sheer good luck is a Near Miss case. The investigation of near-miss, provides superior information about disease burden and indicates quality of care in mothers. It can also broaden understanding of factors that contribute to both maternal morbidity and mortality. This study will give us an understanding of the leading causes of maternal mortality and the health seeking behaviour of the study population.

Conflict of Interest: None.

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