

A Study on Maternal Near Miss: The Submerged Iceberg, in a Tertiary Care Hospital of Central India

Aditya Thakur¹, Manju Toppo², Rama Lodha³

¹Associate Professor, Department of Community Medicine, Netaji Subhash Chandra Bose Medical College, Jabalpur, ²Professor, Department of Community Medicine, Gandhi Medical College, Bhopal, ³Associate Professor, Department of Community Medicine, Gandhi Medical College, Bhopal

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Abstract

Background: Maternal near miss is defined as “a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy”. It shows the quality of obstetric care of any country or society.

Objective: To estimate the proportion of severe maternal morbidity /near miss and its maternal characteristic and perinatal outcomes in tertiary care hospital of central India.

Methods: The present study was carried out at department of obstetrics and Gynecology at Sultania Zanana hospital (SZH) Bhopal for 6 months. A validated semi-structured questionnaire was used to collect the information regarding social demographic profile, ANC history and chief complaints was taken from the relatives i.e. either mother in law or husband. Subsequent information was taken from the mother as she got well and finally got discharge.

Results: majority of the mothers belonged to the age group 18-25% i.e. 58.73%. Around 55.5% of the near miss mothers belonged to rural background. maternal near miss ratio 10.16 / 1000 live birth, the ratio of maternal death to maternal near miss event was 1: 2.17. Hemorrhage and hypertension are the leading causes with 47.61 % and 28.57% respectively. Preterm birth and still birth were more common in maternal near miss cases as compared to general obstetric admission.

Conclusion: Achieving sustainable development goal for maternal mortality is still a far cry. As there is a huge gap of near miss cases to maternal death ratio of present study and ratios of developed countries.

Key Words: Maternal near miss, Mother, Preterm, Still birth, Rural.

Introduction

Every year worldwide, it is estimated that more than 300,000 mothers die from preventable causes during pregnancy, birth, and the postnatal period –

approximately 830 women every day^[1]. From 2000 to 2017, the global maternal mortality ratio declined by 38 per cent – from 342 deaths to 211 deaths per 100,000 live births, according to UN inter-agency estimates. This translates into an average annual rate

Corresponding Author: Aditya Thakur, Associate Professor, Department of Community Medicine, NSCB Medical College, Jabalpur M.P.

E-mail: Adityathakur701@gmail.com

Mobile: 9926822544, 7000936757

of reduction of 2.9 per cent. While substantive, this is less than half the 6.4 per cent annual rate needed to achieve the Sustainable Development global goal of 70 maternal deaths per 100,000 live births^[2].

Maternal mortality ratio (MMR) in India has shown an appreciable decline from 398/100000 live births in the year 1997-1998 to 301/100000 live births in the year 2001-2003. Maternal mortality ratio (MMR) further reduces to 130/100,000 live births (LB) in 2014-2016. Couple of States such as Kerala and Maharashtra have lowered MMR to as low as 46 and 61, respectively, and achieved the MDG goal for 2015 (100/1 lakh live births)^[3].

Maternal mortality is also being used as a sentinel event to assess the quality of a health care system in any country or society. The analysis of maternal deaths has been the criteria of choice for evaluating women's health and quality of obstetric care. But pregnant women's health status is not reflected by mortality indicators alone. Hence the concept of severe acute maternal morbidity (SAMM) is apt for the present health providing system. Severe acute maternal morbidity (SAMM), also known as 'near miss', has been defined by Mantel et al. The concept of maternal near miss is superior over maternal death in drawing attention to surviving women's reproductive health and lives^[4].

In 2009, WHO has come up with clinical, laboratory, and management criteria for the Identification of Maternal near miss cases. According to the WHO, MNM is defined as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy"^[4]. This study tries to estimate the proportion of severe maternal morbidity /near miss and its maternal characteristic and perinatal outcomes in tertiary care hospital of central India.

Material and Methods

It was a hospital based cross sectional study initiated from January 2015 to June 2015. The present study was carried out on seriously ill pregnant mothers from their admission to till they discharge. The present study was carried out at department of obstetrics and Gynecology at Sultania

Zanana hospital (SZH) Bhopal. It's a tertiary care regional referral hospital. SZH receives inflow of patients from the Raisen, sehere and vidisha district. All seriously ill women pregnant women admitted during Ante partum, intra-partum or post partum period in the labour room of obstetrics department of SZH were included in the study. All patients or their relative who are not willing to give interview or participate in the study were excluded. Patient's or relative interview was taken after 2 days of admission to ensure survival after critical condition of patient. WHO near miss criteria was used to select the pregnant mother as our study subject. A validated semi-structured questionnaire was used to collect the information regarding social demographic profile, ANC history and chief complaints was taken from the relatives i.e. either mother in law or husband. Subsequent information was taken from the mother as she got well and finally got discharge. Data was collected and entered in MS excel 2007. Coding and analysis was done using epi info software. Generation of descriptive statistics was done, for association between independent and dependent variable chi-square test was used. Ethical clearance for study was taken from Institutional Ethics committee. Informed consent from the participants was taken. Anonymity and confidentiality of data was assured to the participants.

Results

A total of 63 maternal near miss was identified using WHO criteria. Total live birth was 6198

And still birth recorded was 286. This gives the maternal near miss ratio 10.16 / 1000 live birth. Maternal near miss rate for hospital per 1000 obstetric admissions was 6.97 per 1000 obstetric admissions. the ratio of maternal death to maternal near miss event was 1: 2.17 as shown in table.1.

Table 2. Shows the distribution of maternal factors in near miss mothers. Among 63 maternal near miss cases around 7 (11.1%) mothers got married at the age below 18yrs and 20 (31.74%) near miss mothers got pregnant at the age of 18-20 years. 30.15% Maternal near miss mothers belongs to primi gravida and the multi gravid constitute 69.85% of the near miss cases. It is Important to note that the prim gravida and multigravida women who has 3 or

more gravid constitute 80.95% of the total near miss cases. About 17.46% of maternal near miss cases had not received any Antenatal care visit while 82.54% had at least one Antenatal visits. In figure.1. near miss mothers were categorized by final diagnosis with respect to hemorrhage, hypertension, sepsis, dystocia and Anemia and other medical disorders were considered as causes contributing to maternal near miss. Hemorrhage and hypertension are the leading causes with 47.61% and 28.57% respectively

Table 3. shows the outcomes of maternal near miss mothers. On comparing the mode of deliveries among the near miss and general obstetric admission (none near miss) we find the chi-square value of 0.342 with 1 degree of freedom and p value of 0.552. Which is statistically not significant. While on comparing the live birth and still birth among the near misses and general obstetric admission (none near miss) we get the P value of less than 0.0001 which is considered as extremely significant. On the other hand, while looking for association between term and preterm condition in near miss and general obstetric admission (none near miss) we get the chi square value of 13.22 with the 1 degree of freedom and p value of less than .0001 which is statistically highly significant.

Table 1: Indicators used to describe maternal events in hospital settings

Indicators	Rate & Ratio	(95 % CI)
Absolute number of near miss cases	63	-
Maternal near miss rate per 1000 obstetric admission	6.97	(5.45-8.93)
Maternal mortality rate per 1000 obstetric admission	3.20	(2.55-5.67)
Maternal near miss ratio per 1000 live births	10.16	(7.95-12.98)
Maternal mortality ratio per 1,000 live births.	4.67	(3.26-6.71)
Ratio of maternal near miss event to maternal death	2.17:1	-

Total no. of Obstetric Admission - 9030

Total no. of Live Births - 6198

Total no. of Still Births - 286

Table 2: Distribution of maternal factors in near miss mothers.

s. no	Maternal Factors	No. of Near miss	Percentage
1.	Age at the time of marriage		
	<18 yrs.	7	11.11
	≥18 yrs.	56	88.89
2.	Age at first pregnancy		
	18-20	20	31.74
	>20	43	68.26
3.	No. of Antenatal Checkups		
	0	11	17.46
	1	1	1.58
	2	4	6.35
	3	15	23.81
	≥4	32	50.80
4.	Timing of first ANC visit		
	1 st Trimester	31	59.62
	2 nd Trimester	17	32.69
	3 rd trimester	04	7.69
5.	No. of Gravida		
	1	19	30.15
	2	12	19.05
	3	17	26.98
	≥4	15	23.82
6.	Gestational Age at admission		
	1-12	6	9.52
	13-28	4	6.34
	>28	43	68.27
	Postnatal	10	15.87
	Total	63	100

Table 3: Maternal outcome of near miss mothers.

Outcomes	Near miss (%) [severe acute maternal morbidity]	None near miss (%) [General obstetric admissions]	Chi-square value	P value
Mode of delivery *			$\chi^2 = 0.342$ df=1	0.58
Normal Vaginal	34 (69.38)	4140(64.34)		
Caesarean Section	15(30.61)	2294(35.65)		
Delivery outcome [#]			$\chi^2 = 161.3$ df=1	<0.001
Live Birth	32(58.18)	6198(95.58)		
Still Birth	23(41.81)	286(4.42)		
Pregnancy duration			$\chi^2 = 13.228$ df=1	<0.001
Term	41(70.68)	5630(87.50)		
Preterm	17(29.32)	804(12.50)		

* 9 – emergency laparotomy, 5 – pregnancy continued. # 3 – abortions, 5- Pregnancy continued.

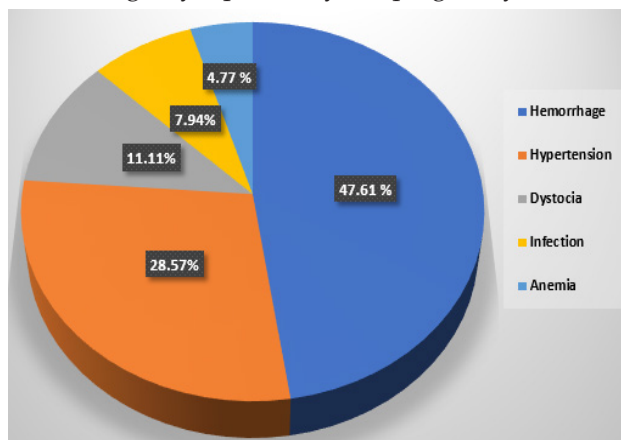


Figure.1. Diagnosis of Maternal near miss events.

Discussion

The maternal near miss ratio was 10.16/1000 live births, which was lower than Roopa PS et al who had reported ratio of 17.8/1000 live births [5]. Previous studies from developing countries show range anywhere between 15–40/1000 live births [6–8]. near miss events to maternal deaths ratio was 2.17:1. Which means every 2 to 3 life threatening conditions there was one maternal death in the facility. low ratio indicates a poor obstetric care in the facility. while previous studies from our country shows range from 3-8: 1 [9–10]. Higher ratios indicate better obstetric care. Syrian study showed a ratio of 60: 1 and study done in Nepal showed a ratio of 7.2: 1 [11–12]. Whereas there is still a long way to go if we compare near miss to death ratio with western countries [7]. In present study 58 percent of the near miss was below 25 years of age.

This finding was in line with the results of studies done by Roopa et al in Karnataka, India & by Almeria et al in Syria which shows similar age of the near miss mother [12,13]. A study done by Rathod et al at Aurangabad, at tertiary referral center of rural India shows a mean age of 23.63 in near miss [14]. Previous studies show a significant association between rural residence and near miss event [15–17] as in our study too, majority of cases were from rural areas. It may be relatable to the fact that most of the near-miss cases get delayed in reaching and receiving adequate care.

In present study half of the maternal near miss cases were those who had less than 4 ANC visits during Antenatal period. In agreement to our findings study from Ethiopia states that Mothers who did not have antenatal follow-ups were more likely to experience near-misses [18,19]. In present study there has been a rise in hypertensive cases which makes it second most common cause for near miss events. Hemorrhage is still a most common cause of maternal near miss and maternal deaths in our study. In the study done by Shrestha et al in Nepal most common cause was Pregnancy induced hypertension while Bakshi et al in North India and Gupta D et al reported many severe PPH cases as cause for maternal near miss [20–22]. Findings in our study reveals that higher Still birth is associated with the maternal near miss events. The result was consistent with studies conducted elsewhere that tried to investigate the risk of still birth among maternal near miss cases [23–26]. Association of Pre term birth as an outcome to near miss event was also found to be significant. Similar

finding was reported by Oliveira Jr et al where the odds of preterm delivery in near miss cases was higher [27].

Conclusion

Achieving sustainable development goal for maternal mortality is still a far cry. As there is a huge gap of near miss cases to maternal death ratio of present study and ratios of developed countries. Through maternal near miss cases we can develop a system through which we can identify health system failures or priorities in maternal health. Because a mother surviving a fatal maternal morbidity can give more information than a maternal death. It has the advantage of events still being rare enough not to overload clinicians and data capturing personnel within a facility. MNM cases occur more often as compared to maternal deaths and have similar pathways that can directly give information about the strengths and weaknesses of the system that need to be overcome during the process of providing healthcare. Strengthening the available health system in rural parts of the country with a focus on maternity service is also a crucial step to avert serious maternal complications.

Conflict of interest: None

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