



# Study of Maternal Near Miss in Tertiary Care Center: Prospective Observational Study in Lady Hardinge Medical College, Delhi, India

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## Abstract

To study the causes responsible for maternal near miss morbidity and mortality. To evaluate the avoidable factors in maternal near miss morbidity and maternal mortality. A sample size of 100 pregnant woman who satisfy the WHO inclusion criteria for MNM and all maternal mortality during the study period. A detailed history obstetric examination, informed consent, demographic profile like age, parity, booking status, gestational age, h/o obstetric complications were taken, presence of organ dysfunction, ICU admission, the hospital course, delays at the level of the patient and reasons for referral to this Hospital were taken followed till delivery and maternal outcome observed. In a period of one year, there were 2,085 deliveries, 1578 live births, 507 still birth, Mean age of near miss was  $26.30 \pm 4.70$  year (41.98%) and average maternal death was 25.89. WLTC-100. MNM was 81 cases. Maternal death was 19 cases. Maternal near miss ratio was 51.33/1000 live birth. Maternal near miss mortality ratio is 4.3:1 (MNM/MD)-Mortality Index was 19%. SMOR 63.53/1000 LB. MMR=101.57/100,000 LB. According to the result and discussion it is concluded that haemorrhage and hypertension were the leading cause of near miss events. As near miss analysis indicates the quality of health care and a good alternative indicator of health care system.

**Keywords:** Maternal near miss, Maternal death, Maternal mortality rate, Maternal near miss ratio, Maternal near miss mortality ratio

## Introduction

Maternal mortality is one of the important indicators used to measure maternal health [4]. Maternal death in absolute numbers have decreased in our country, but the maternal mortality ratio is still high. To improve maternal health, Millennium development goals (MDG) were projected in 2000, which should have been achieved by 2015. Improvement of maternal health is one of the Millennium Development Goals, MDG 5 (Target 5 A), which calls for the reduction of maternal mortality ratio (MMR) by three quarters (75%) between 1990 and 2015 [1,2]. From 1991 to 1993, MMR was 437 per 100,000 live births, which was reduced to 178 per 100,000 live births in 2010-2013. In MDG, the MMR reduction from 140 per 100,000 live births to 109 per 100,000 live birth was projected to have been achieved by 2015.

A woman's health status is not reflected by maternal mortality alone, but MNM should also be included; therefore, MNM becomes an essential indicator for the measurement of maternal health and the quality of obstetric care.

"Maternal Near Miss" is defined as a pregnant or recently delivered woman who survived a life-threatening complication during pregnancy, childbirth or 42 days after the termination of pregnancy [3].

The baseline assessment can be performed in individual healthcare centres by evaluating the cause of maternal mortality (MM) and maternal near-miss (MNM). Therefore, WHO suggested

maternal near-miss criteria for organ dysfunction. This criterion includes:

- i) Clinical
- ii) Laboratory
- iii) Management.

Intervention for improving health care was evaluated, and the factor which led to the delay in the management of cases was studied at the three levels [7].

- 1<sup>st</sup> level delay-At patients' level
- 2<sup>nd</sup> level delay-At referral level
- 3<sup>rd</sup> level delay-At tertiary health centre

So, this study is being done to evaluate the avoidable factors and to study causes responsible for maternal near miss morbidity and mortality.

## Material and Method

In an observational study conducted in the department of obstetrics and gynaecology for one year, 100 cases of life-threatening conditions which met the WHO MNM Criteria [5], and gave consent to participate in the study, were recruited.

A structured performa was prepared, which included demographic profiles like age, parity, booking status, gestational age, maternal complications/intervention and causes for referral

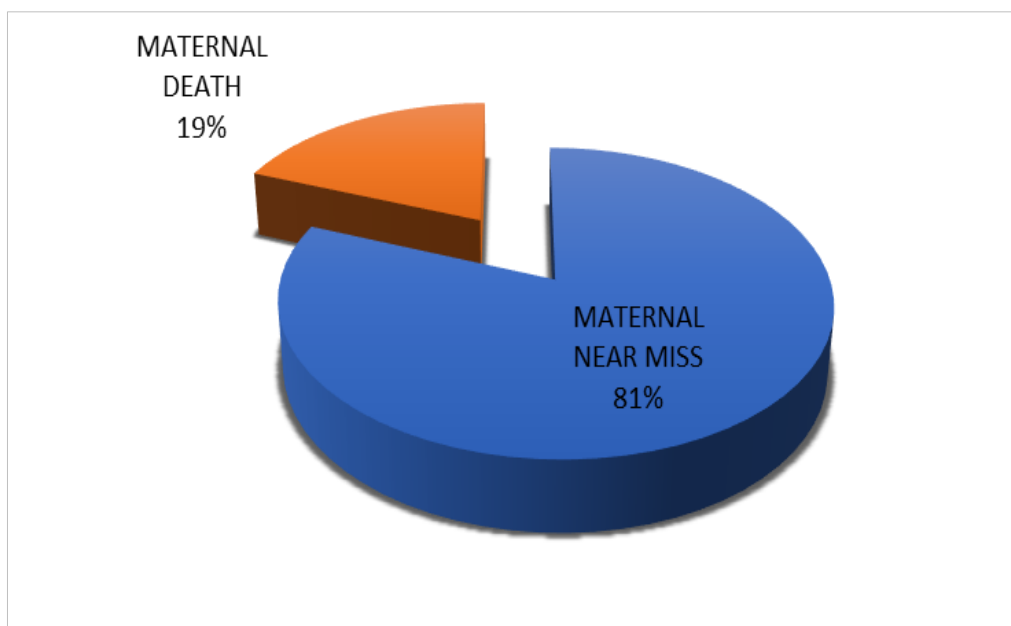
were studied. The delays in treatment were noted at the patient level, at referral to this Hospital from PHC/nursing home/private hospital, and at the level of the higher centre were noted. Detailed examination like general physical examination, obstetrical examination, surgical procedures undergone, ICU care was noted, relevant investigation done, complications and comorbidity were studied. The course of treatment and the maternal outcome was observed. Collected data were analysed, and results and the indices were calculated.

## Results

In the study period, the total number of deliveries was 2085, out of which 1578 were live birth, and 507 were stillbirths. One hundred women had life-threatening conditions, of which 19 had a maternal death, and 81 had a maternal near miss (Reference Table & fig 1)

**Table 1: Distribution of cases according to maternal outcome**

Outcome	Number of subjects	Percentage
MATERNAL NEAR MISS	81	81.0
MATERNAL DEATH	19	19.0
Total	100	100.0



**Fig 1: Pia diagram showing the maternal outcome as maternal near miss and maternal death.**

**Table 2: Distribution of cases according to mean age, POG, parity, registration status.**

	MNM		MD		Total
	(N=81)	(%)	(N=19)	(%)	
Mean Age	26.30±4.74year	-	25.89±5.01year	-	26.22±4.74year
POG (weeks)					
24+0 – 35+6	34	41.98%	11	57.89%	45
>36	29	35.80%	5	26.32%	34
<b>Parity</b>					
Primi	23	37.1%	5	38.5%	28
Multi	39	62.8%	8	61.6%	47
<b>Registration status</b>					
Unbooked	10	12.35%	3	15.78%	13
Booked in this hospital	12	14.81%	2	10.54%	14
Registered in other hospitals i.e	59	72.84%	14	73.68%	73
i) Government	25	30.86%	9	47.37%	34
ii) Private	32	39.51%	4	21.05%	36
iii) Dispensary	2	2.47%	1	5.26%	3

The mean age of MNM and MD were 26.30±4.74 year and 25.89±5.01yrs, respectively. Twenty-eight women with primiparity had 38.5% MD while 37.1% had MNM, whereas 39 multiparous women with 61.5% had MD & 62.8% had MNM. Maximum 45/100 cases had POG 24-35+6 weeks in which 57.89% had MD & 41.98% had MNM, whereas 34/100 cases had POG >36 weeks had 26.32% MD and 35.80% had MNM were observed. Among women who were admitted and had maternal near-miss, 59 cases (72.84%) were

registered in another hospital, i.e., 25 cases from government hospitals, 32 cases from private hospitals, and three from dispensary. 12 cases (14.81%) were booked in this hospital, and 10 cases (12.34%) were unbooked. Similarly, among 19 cases of maternal death, 14 cases (73.68%) were registered in other hospitals and two cases (10.54%) cases were booked in this hospital, while three cases (15.8%) were unbooked (Reference table 2).

**Table 3: Distribution of cases according to diagnosis.**

Variables	MNM		MD		TOTAL	Chi-sq	P
	N*	% #	N*	% #			
Anemia in Pregnancy	28	34.5%	8	42.2%	36	0.275	0.6
<b>Early Haemorrhage</b>							
Ectopic Pregnancy	7	8.6%	0	0%	7	1.766	0.184
Abortion	3	3.7%	0	0%	3	0.725	0.394
Vesicular Mole	2	2.4%	0	0%	2	0.479	0.489
<b>Late Haemorrhage</b>							
APH	31	38.2%	4	21%	35	3.034	0.55
PPH	18	22.2%	6	31.5%	24	0.739	0.39
DIC	7	8.6%	9	47.3%	16	17.17	<0.01
Inversion Uterus	4	4.9%	0	0%	4	0.977	0.323
Ruptured Uterus	8	9.8%	0	0%	8	2.04	0.153
<b>Septicemia</b>							
Prolonged Leaking PV	15	18.5%	3	15.7%	18	0.078	0.78
P. Sepsis	8	9.8%	4	21%	12	1.82	0.177
Retained Placenta	5	6.1%	1	5.2%	6	0.023	0.881
<b>Hypertensive Disorder in Pregnancy</b>							
PIH	26	32%	10	52.6%	36	2.816	0.093
Hellp Syndrome	9	11.1%	7	36.8%	16	7.581	0.006
Eclampsia	12	80%	3	20%	15	6.321	0.915

\*A patient can have more than one diagnosis at the time of admission.

#Percentage is calculated out of 81 cases in the maternal near miss group and 19 cases in the maternal death group.

Under maternal near-miss event, 12 cases of hemorrhage were seen in early pregnancy; there were 7 cases (8.6%) of ectopic pregnancy - 3 cases (3.7%) of abortion and 2 cases (2.46%) of molar pregnancy. All women with blood loss required blood and blood products if there was a fall of saturation  $PO_2 < 90\%$  and with abnormal heart rate, they required ventilation, and all 12 cases were rescued, thus had near miss. Thirty-five cases of APH due to placenta previa, placenta accreta, percreta, few cases of abruptio placentae in pre-eclampsia and eclampsia were managed actively by performing LSCS. When intra-operative blood loss was not controlled by transfusing the PRBC, FFP, and platelets, a Cesarean hysterectomy was performed in these cases. Thirty-one cases of APH were revived successfully, while four women died.

There were 24 cases (53.7%) with PPH, 5 cases (6.1%) with retained placenta, and 4 cases (4.9%) of inversion uterus. These cases could be saved by giving good Operation facilities, prompt management by infusing oxytocins, if required, uterine artery ligation, and internal iliac artery ligation was done. A cesarean hysterectomy was done when PPH was still uncontrolled. In the retained placenta cases, manual removal of the placenta along with

blood product transfusion was done. In the inversion uterus, prompt repositioning of the uterus was performed along with management of hypovolemic shock. However, one case who was unbooked with an inversion uterus and retained placenta had PPH and came directly from her home and could not be saved. Six cases died due to PPH. Among hypertensive disorders, 36 cases (84.6%) had PIH, and 16 cases (48.9%) were diagnosed with HELLP syndrome. Among women with near-miss with sepsis, 15 cases (18.5%) had prolonged leaking PV, and 8 cases (9.8%) had Puerperal sepsis, whereas among women who had a maternal death, 3 cases (15.7%) had prolonged leaking PV and 4 cases (21%) had puerperal sepsis. In septicemia, continuous vasoactive drugs, intravenous antibiotics infusion, and early surgical intervention were done. 8 Cases (9.8%) who had ruptured uterus hysterectomy was done. In patients with severe anemia without APH, 28 cases (34.5%) had a near-miss event, 8 cases (42.2%) ended in maternal death, however, among severely anemic women with pulmonary oedema or CHF who required prolonged ventilation and subsequently died in ICU, probably due to ventilator-acquired pneumonia and ARDS (reference table 3.)

**Table 4 A: Distribution of cases, according to WHO clinical based criteria of Maternal near miss.**

Clinical based criteria	Maternal near miss		Maternal death		Total	P value
	N	%	N	%		
Shock	27	71%	11	28.94%	38	0.02
Acute Cyanosis	0	0%	6	100%	6	<0.01
Gaspings	11	44%	14	56%	25	<0.01
RR > 40 or <6/min	44	74.6%	15	25.4%	59	0.049
Oliguria	4	33.3%	8	66.7%	12	<0.01
Failure to form clots	17	68%	8	32%	25	0.056
LOC > 12 hr	13	54.2%	11	45.8%	24	<0.01
Cardiac arrest	0	0%	19	100%	19	<0.01
Stroke	1	25%	3	75%	4	0.004
Uncontrollable fits	18	75%	6	25%	24	0.39
Preeclampsia with jaundice	5	50%	5	50%	10	0.008

According to clinical-based criteria, (75%) of uncontrollable fits, (74.6%) of respiratory distress, (71%) of shock were revived as near-miss by giving good ventilator support and prompt fluid replacement. Whereas (75%) stroke, (66.7%) oliguria and (56%) gasping had maternal death even by giving vasoactive drugs,

repeated dialysis and continuous oxygen supply replacement syndrome. PIH and eclampsia were managed by giving  $MgSO_4$  and antihypertensive drugs. If uncontrolled blood pressure was still, an NTG drip was started and required early termination of pregnancy (reference table & Fig. 4A)

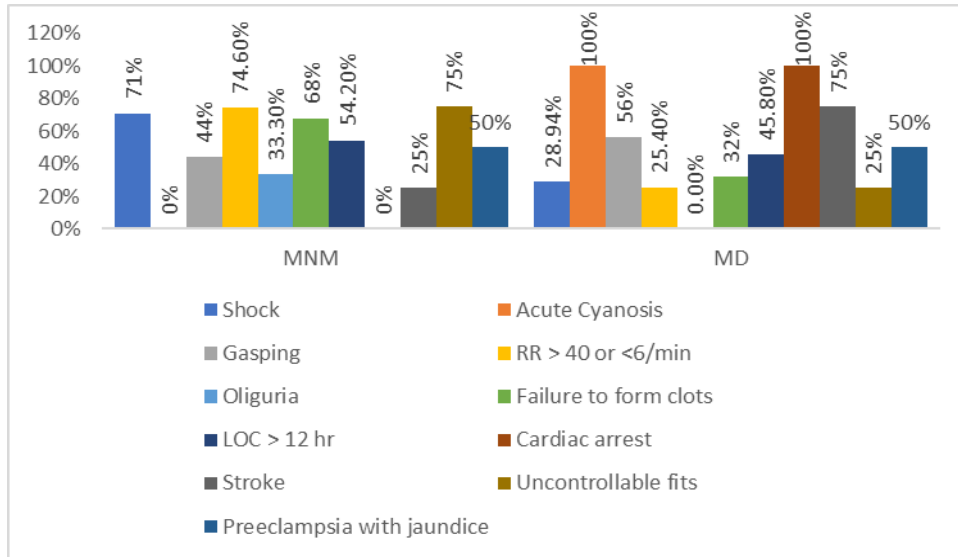


Fig 4 A: Distribution of maternal outcome according to WHO clinical based criteria

Table 4 B: Distribution of cases, according to WHO laboratory-based criteria of Maternal near miss.

Laboratory based criteria	Maternal near miss		Maternal death		TOTAL N
	N	%	N	%	
Oxygen saturation <90%	42	71.2%	17	28.8%	59
PaO2/FiO2 < 200mmhg	22	59.5%	15	40.5%	37
Creatinine ≥ 3.5mg/dl	6	42.9%	8	57.1%	14
Bilirubin >6mg/dl	6	37.5%	10	62.5%	16
pH <7.1	46	71.9%	18	28.1%	64
Lactate >5mmol/l	5	26.3%	14	73.7%	19
Acute TCP <50,000/ml	15	75%	5	25%	20
LOC and ketoacidosis	1	100%	0	0	1

When laboratory-based criteria were evaluated, 75% cases with thrombocytopenia, 71.9% cases with decrease in (Ph<7.1), 71.2% cases fall of oxygen saturation were near miss. Whereas, maternal

mortality was seen in Lactate >5mmol/l (73.7%) cases, Bilirubin>6mg/dl (62.5%) of cases and creatinine >3.5mg/dl (57.1%) (reference Table & Fig 4B)

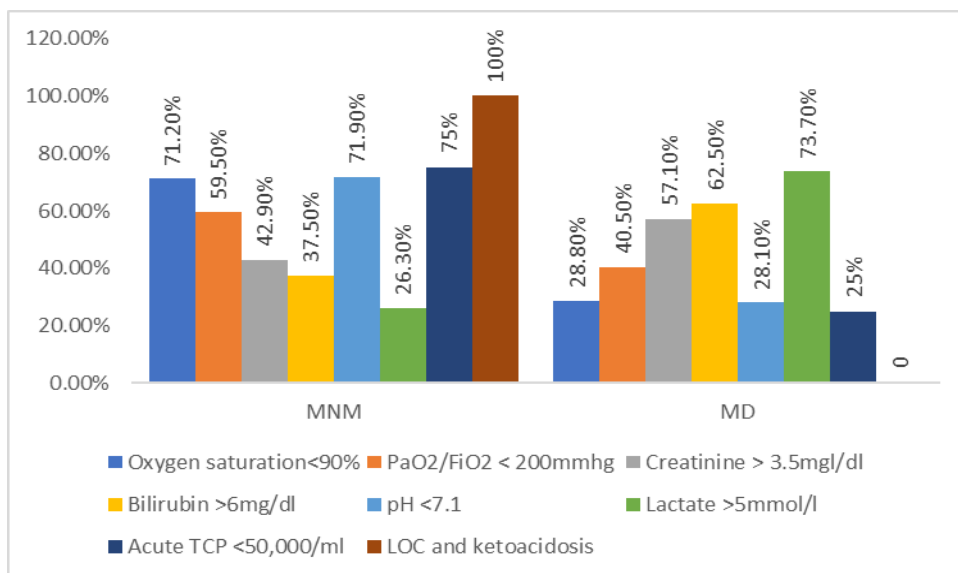


Fig 4B: Distribution of maternal outcome, according to WHO laboratory-based criteria of Maternal Near Miss.

Table 4 C: Distribution of cases, according to WHO management-based criteria of Maternal near miss.

Management based criteria	Maternal near miss		Maternal death		TOTAL N
	N	%	N	%	
Use of continuous vasoactive drugs	48	71.6%	19	28.4%	68
Hysterectomy due to haemorrhage or infection	20	83.3%	4	16.6%	24
Transfusion ≥5 units of blood	54	80.6%	13	19.4%	67
Intubation	5	27.8%	13	72.2%	18
Dialysis	9	75%	3	25%	12
CPR	5	21.7%	18	78.3%	23

On the basis of management-based criteria, 20 cases (83.3%) had hysterectomy due to haemorrhage or infection, 54 cases (80.6%) cases had transfusion of >5 blood and blood products, 9 cases (75%) dialysis, 48 cases (71.6%) with the use of vasoactive drugs, 5 cases (27.8%) intubation not related to anaesthesia and 5 cases (21.7%)

needed resuscitation were survived as near miss. Whereas, 18 (78.3%) cases who received CPR, 13 (72.2%) intubation not related to anaesthesia, 19 cases (28.4%) use of vasoactive drugs had maternal mortality even after providing a good obstetric care (Referance Table & Fig 4 C.)

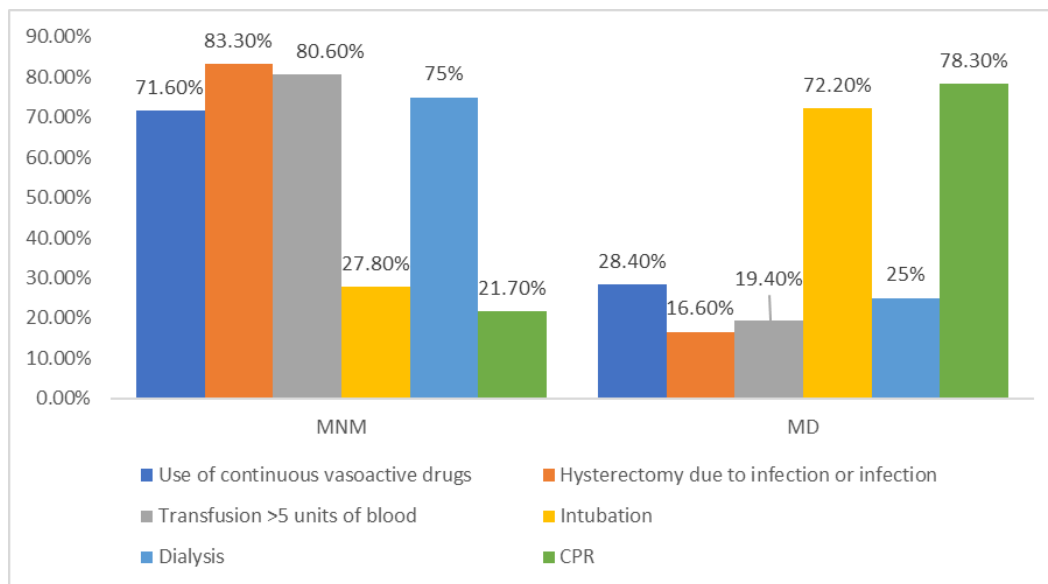


Fig 4C: Distribution of maternal outcome, according to WHO management-based criteria of Maternal Near Miss.

Table 5: DELAY -1/2/3- Association between maternal outcome and patient-oriented problems

Patient oriented problems (Delay-1)	Maternal outcome					
	Maternal near miss		Maternal death		Total	
	N	%	N	%	N	%
Delay in presentation to hospital/Late referral	57	78.10%	16	21.90%	73	100%
Reasons for referral (Delay-2)						
Lack of Blood/blood products	42	77.80%	12	22.20%	54	100%
Lack of drugs & equipment	9	69.20%	4	30.80%	13	100%
Lack of ICU	37	82.20%	8	17.80%	45	100%
Medical personnel problem (Delay-3)						
NO PROBLEM i.e no delay in diagnosis& definitive t/t	25	96.20%	1	3.80%	26	100%
Delay in making correct diagnosis	42	80.80%	10	19.20%	52	100%

Delay 1 shows the association of maternal outcome with patient-oriented problems in 73 cases who had delay in presentation to hospital, 16 cases (21.9%) had maternal death while 57 cases (78.1%) had near miss.

Delay 2 shows referral from other hospital. Pregnant women were referred from other hospital (PHC/nursing home) in view of lack of blood/blood products had 54 cases out of which 12 cases (22.2%) had MD whereas 42 cases (77.8%) had survived as near miss. 45 cases referred due to lack of ICU, these women came in poor general condition, of which 37 cases (82.2%) survived as NM but 8 cases (17.8%) had MD in spite of good ventilator support, blood & blood product transfusion.

Delay 3 shows an association between maternal outcomes and problems faced by medical personnel after coming to this hospital. Fifty-two cases had a delay in making the correct diagnosis. Forty-two cases (80.8%) had near misses, and 10 cases (19.2%) had maternal death. This problem occurred due to a delay in the results of getting relevant investigation.

## Discussion

The "Study of maternal near-miss in tertiary care center" was conducted in the Departments of Obstetrics & Gynaecology and Anaesthesia from November 2015 to March 2017 at Lady Hardinge Medical College & Smt. Sucheta Kriplani Hospital.

The following are the results of the indicators related to maternal health derived from the study.

WLTC-Total women with life-threatening complications were 100. It refers to all women who either qualify as MNM cases or those who died (i.e. women presenting a severe maternal outcome). It is the sum of MNM and MD.

MNM-Maternal Near Miss was 81 cases. MD-Maternal death was 19 cases.

The total number of deliveries was 2085 in a year, stillbirth was 507, and live birth (LB) was 1578.

The maternal near-miss ratio (MNMR) was 51.33/1000 LB. (MNMR=MNM/LB). It refers to the number of MNM cases per 1000 live births. This indicates that the resources and care were better provided in the institution so 51.33/1000 LB women could be saved.

In the present study, MNMR was 51.33/1000 LB higher than in the study by Sharma H et al. [10] (42.1) and Almeria Y et al. [16] (32.9). It concludes that the resources and care were better provided in the institution so 51.33/1000 LB women could be saved. The present study on the Maternal near-miss ratio (4.3:1) is comparable with another study. Therefore, this ratio indicates that the standard of obstetric care that the hospital provides is better than other quoted studies. Higher ratios indicate better care.

In the present study, MI was 19% which was comparable to the above study, except for Bansal et al. [11] 32.7%. The lower the

index, the fewer women with life-threatening conditions die indicates better quality of care.

SMOR; Severe Maternal Outcome Ratio; (MNM+MD/LB) = 63.53/1000 LB, which is higher than the Sharma H et al. [10] 52.7/1000 LB. This indicator gives an estimate of the amount of care and resources that would be needed in an area or facility from where the cases are referred.

The MMR of the present study (101.57) was less than the other studies. This indicates that a better quality of care for the woman and the baby was provided. Most of the women were referred from various centres and health facilities.

In the present study, the mean age of near-miss cases was  $26.30 \pm 4.70$  years, and maternal death was  $25.89 \pm 5.01$  year in the present study is comparable to Kalra et al. [12],  $24 \pm 3.11$  year near miss and  $26 \pm 2.44$  years with maternal death, respectively. Among maternal near-miss, majority of women were multiparity (62.8%) which is comparable to Bansal et al. [11] (64.10%). In multiparity, maternal death was (61.6%) which is more than the other quoted studies. In the present study majority of near-miss (41.98%) and maternal death (57.89%) were in the POG 24-35+6 weeks. The maternal death in the present study is less than in the study done by Bansal et al. [11] (63.15%). In contrast, study by Waterstone et al. [8] (36.9%) and Morse et al. [19] had 36% near miss, which is comparable to the present study >36 weeks (35.80%) near miss. The conclusion drawn is that with optimum facilities, more women can be saved.

A higher number of unbooked cases were seen in Alka et al. [14] study, that is (92.31%) and 87% in Almeria Y et al. [16], which were higher than the present study (13%).

Many cases were referred from maternity hospitals, private hospitals and nursing homes. In the present study, 73% of patients referred from other hospitals were seen, which was higher than the other studies like Kalra et al. [12] (64.2%) and Almeria Y et al. [16] (12.7%). Many cases are being referred due to the availability of NICU, ICU and 24 hr blood bank facility in this hospital. Thus, with the present health care system, most antenatal women are getting good antenatal care from doctors.

In the present study, 14% of cases were booked in this hospital, which is lesser in comparison to 36.4% in Almeria et al. [16]. It shows as high-risk cases are being supervised with better facilities in the hospital to provide better antenatal care and regular follow-up as it is a tertiary care hospital.

In clinically based criteria, in the present study, 28.94% of cases of maternal death were present, which is comparable to the study of Souza P et al. [15] study. Whereas, in the present study, 71% cases of near-miss were seen. The women came in haemorrhagic shock due to APH, PPH, and anaemia in pregnancy. They were revived by giving fluid replacement, blood and blood products. However, in the present study, 25.4% of cases of Respiratory distress had maternal death. 7 4.6% had near-miss. 25.4% of cases subjected to blood gas analysis were intubated and could not be saved. MD in this study was 29.50% which was comparatively less than 38.54% stated by Souza P et al. [15].

Women with hypertension, acute Renal failure & deranged Kidney function tests had oliguria. Oliguria was present in 33.3 % in NM. However, 66.6% of cases had maternal death.

Failure to form clots is lesser in the studies done by Pandey A et al. [13] (7.74%) and Mentel et al. [9] (1.1%) as compared to the present study (68%).

Some cases had deranged LFT, and patients had acute hepatic failure and hepatic encephalopathy. These patients could not be saved despite the transfusion of blood and blood products. Therefore, in the present study, maternal death was seen in 32 % of cases which is comparable to the study by Souza P et al. [15] (34.38%).

The women with a life-threatening condition, where the fall of oxygen saturation was <90%, were immediately intubated. ABG analysis was done & managed accordingly, so 71.2% had NM,

which was higher than 8.21% NM in the study of Pandey et al. [13]. When S. Creatinine was >3.5mg/dl, these women were given dialysis. Then 42.9% of cases had MNM cases, which was higher than 11.8% of MNM by Pandey et al. [13].

In management-based criteria; when vasoactive drugs were used to revive several morbid cases; of which 71.6 % cases had near misses, this was comparable to 64.4% NM reported by Karolinsky A et al. [18]. However, in the present study, 28.4 % had a maternal death, which was less than 41.39% reported by Souza P et al. [15]. It signifies that this hospital provided good care to morbid cases, providing prompt and active management by utilizing vasoactive drugs, and IV fluids to save the life of women.

Among 67 cases, which were given >5 units of blood and blood products, 19.4% had maternal death, which was comparable to 20.08% MD reported by Souza et al. [15]. 80.6% of cases were revived successfully in the present study, which was comparable to the 79.1% NM study done by Loftufo et al. [17]. Thus, intubation, ICU care, use of vasoactive drugs and transfusion of more than five blood and blood products had higher cases of near-miss and lower maternal death, indicating optimal care provided to critically ill women in ICU. 25% cases of maternal death are present in this study which is less than 38.10% present in other studies done by Souza Pet al [15]. At the same time, 75% of Cases had dialysis at the correct time and were given more than one dialysis too. However, in a few cases, even after repeated dialysis, continue fluid challenges given to the patient and revive such cases.

A very important factor which leads to maternal mortality was the non-medical causes like:

1. The first delay - At the patient's level. The most common delay is the unavailability of relatives. 41 cases out of 51 patients had near misses due to the same, which was lower than 25 cases of Taly et al. [6]. Forty cases were late in reaching the hospital due to lack of transportation; 25% had MD in the present study, which was lower than Taly et al. [6] with 100% of MD. This may be due to ignorance and the inability to judge the seriousness of the problem by the relatives.
2. The second delay - referred from another private or government hospital for delivery before coming to a tertiary hospital. There were 54 cases which were referred here due to lack of blood & blood products, out of which 22.2% had MD in this institution which was higher than the 12.5% of MD in a study done by Taly et al. [6]. 77.8% had near miss, which was higher than the 8% near-miss reported in the study of Taly et al. [6].
3. The third delay was seen in 2 cases due to the unavailability of medical health personnel problem after coming to the hospital. Out of 26 cases, 3.8% of cases had a maternal death, despite giving good ICU care and 96.2% survived as a near miss.

The main cause of maternal death was hypertension in pregnancy/eclampsia. These women could be saved if antihypertensive drugs, injection of Mgso4 strict BP monitoring and early decision is taken for termination of pregnancy. The 2nd case of maternal death was haemorrhage, i.e. PPH (postpartum haemorrhage). So if injection oxytocin is available, then PPH can be prevented, and if required, balloon tamponade can be provided in the labour room itself before taking help advice from seniors, history of blood transfusion will improve the management of women with comorbidities. The third cause of maternal death was septicemia, sepsis, which could be reduced by maintaining asepsis practice as proper handwashing and also a provision to provide broad-spectrum antibiotics. A facility of HDU/ICU to monitor the high-risk cases should be present.

## Conclusion

The cause of near-miss was the ignorance, lack of awareness about maternal health, lack of human resources, and lack of medical equipment in ICU and blood bank in other hospitals. The important non-medical factor which can help to decrease near misses and maternal death is to cut down the delays at every level. The conclusion drawn is that optimum care and adequate facilities can save more women. Emphasis should be given to early booking and regular antenatal check-ups with adequate investigations. Therefore, every institution should give an audit to improve maternal health and provide resources in the hospital to reduce maternal mortality. This will also give an opportunity to audit the effect of government-run schemes at various levels.

## List of abbreviations

WLTC: Total woman with life threatening complication

MNM: Maternal Near Miss

MD: Maternal Death

LB: Live Birth

Maternal near miss ratio: MNMR. (MNMR=MNM/LB)

MNM: MM Ratio -Maternal near miss mortality ratio

SMOR: Severe Maternal Outcome Ratio;( MNM+MD/LB)

MI: Mortality index

MMR: Maternal mortality rate (MD/LB×100,000)

POG: Period of gestation

SMM: Severe maternal morbidity

SAMM: Severe acute maternal morbidity

## Conflicts of Interest

The authors of this work have nothing to disclose.

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## Author Contribution

**Chandrakanta:** Data collection and literature review, analysis and interpretation, writing and manuscript editing, clinical diagnosis and management of the case.

**Bhawna Gupta:** Data collection and literature review.

**Abha Singh:** Data interpretation and manuscript editing, clinical diagnosis and management of the case

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