

# Maternal Characteristics of Near Miss Cases -A Hospital Based Study

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## ABSTRACT

**Background:** Effective implementation of the near-miss concept will help analyze the high-risk group and strengthen the entire healthcare setup for enabling favorable outcome. The present study aims to assess the features of near-miss obstetric cases reporting to government tertiary hospital in order to propose significant interventions to save the high risk group of patients. **Methods:** The present study was conducted among patients admitted in labour room including referred, emergency and booked admissions. Women with severe complications of pregnancy / labour/ puerperium irrespective of gestational age as per the WHO near miss criteria were identified and studied. The first step in implementing the near-miss approach was to systematically identify women with severe complications of pregnancy. **Results:** Most common direct complicating factor being hemorrhage 26%, eclampsia 18.7%, sepsis 9.8%, rupture uterus 4% (rupture uterus was present in 2 cases of grandmultipara and 3 cases had more than 2 previous LSCS) and obstructed labour 3.2%. Among the indirect causes anaemia 34.1% was leading cause. Out of this iron deficiency anaemia was seen in 88% cases and 12% cases had other types of anaemia like megaloblastic and thalassemia minor. Respiratory disease 4%, liver disease 5.7% (mainly hepatic encephalopathy) and heart disease 1.6% (1 patient had dilated peripartum cardiomyopathy and 1 patient was revived from sudden cardiac arrest). **Conclusion:** The most common direct cause for maternal near miss is hemorrhage. Although hemorrhage is the leading cause of maternal death worldwide but postpartum hemorrhage is highly unpredictable and poses a major challenge to obstetricians. Eclampsia and severe preeclampsia are one of the easiest identifiable and avoidable factors for preventing maternal death. Health care providers like ASHA workers and ANMs who have first contact with the antenatal women should be trained to tally and read the dipstick test results and inform the doctor accordingly.

**Keywords:** Hemorrhage; Maternal Near miss; Pregnancy.

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## INTRODUCTION

Maternal Near miss is defined as woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy. Maternal mortality is one of the most important indicators used for assessing maternal health. According to WHO, a maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.<sup>[1]</sup>

Maternal mortality ratio measure the women dying from pregnancy or puerperal causes and is defined as the total number of female deaths due to

complications of pregnancy, childbirth or within 42 days of delivery from puerperal causes in an area during a given year / total number of live births in the same area and year x 100,000.<sup>[2]</sup>

Late maternal death due to complications of pregnancy or childbirth is a death beyond 6 weeks postpartum period. Due to increasingly available modern, life sustaining procedures and technologies more women are able to survive adverse outcomes of pregnancy and delivery due to which death may be delayed beyond 42 days postpartum.<sup>[2]</sup>

Causes of maternal mortality being: Hemorrhage, hypertension, eclampsia, obstructed labour, abortion, etc. Anemia being one of the major indirect cause along with other indirect causes such as hepatitis, cardiovascular diseases, endocrine diseases and metabolic disorders, infections such as tuberculosis, malaria and increasing number of infections like HIV/AIDS.<sup>[3]</sup>

Social factors contributing to maternal mortality in India are: Age at child birth, parity, too close pregnancies, family size, malnutrition, poverty, illiteracy, ignorance and prejudices, lack of

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maternity services, shortage of health and manpower, delivery by untrained dais, poor environmental sanitation, poor communication and transport facilities, social customs, etc.<sup>[4]</sup>

Women who survive severe obstetric complications have many characteristics in common with maternal death events particularly on risk factors. Recognizing this fact, World Health Organization (WHO) called for increased study of maternal near miss. Maternal near miss is also called severe maternal morbidity, hence these terms are used interchangeably.<sup>[5]</sup>

Effective implementation of the near-miss concept will help analyze the high-risk group and strengthen the entire healthcare setup for enabling favorable outcome.<sup>[6]</sup> The present study aims to assess the features of near-miss obstetric cases reporting to government tertiary hospital in order to propose significant interventions to save the high risk group of patients.

## MATERIALS & METHODS

The present study was conducted in the department of Obstetrics and Gynaecology, Rajindra Hospital, Patiala for a period of one and a half year starting from April 2016 to September 2017. The study was conducted on the patients admitted in labour room including referred, emergency and booked admissions. Women with severe complications of pregnancy / labour/ puerperium irrespective of gestational age as per the WHO near miss criteria were identified and studied.

The first step in implementing the near-miss approach was to systematically identify women with severe complications of pregnancy.

The eligibility was not restricted by gestational age at which complications occurred i.e. women having abortions or ectopic pregnancies as well as medical conditions and presenting with any of the inclusion criteria were eligible.

The present study is conducted based on WHO 2010 near miss criteria. The latest Near-miss operational guidelines are issued by Government of India in 2014. Women that developed those conditions unrelated to pregnancy (i.e. not during pregnancy or 42 days after termination of pregnancy) were excluded.

An informed consent of the patient was obtained and the information was recorded on the proforma attached. The collected data was compiled and analysed.

## RESULTS

**Table 1: Age-wise distribution of near miss cases**

Age	Number N=123	Percentage (%)
<20year	04	3.3
20-35year	118	95.9
>35year	01	0.8
Mean age	25.8 years	

[Table 1] shows the distribution of near miss cases according to different age groups. Maximum number of cases fall between 20-35 years of age constituting 95.9% of total near miss cases in present study which is the common reproductive age group.

**Table 2: Parity distribution of near miss cases**

Parity	Number N=123	Percentage (%)
Primipara	39	31.7
Multipara	84	68.3

[Table 2] shows distribution of near miss cases according to parity with multipara forming majority of cases i.e. 68.3% as the number of complications increase in multipara patients.

**Table 3: Distribution of near miss according to Gestational age**

Gestational age	Number N=123	Percentage (%)
<13 weeks	15	12.2
13-28 weeks	22	17.8
>28 weeks	52	42.4
Postnatal	34	27.6

[Table 3] shows distribution according to gestational age. In first trimester there were 12.2% cases of ruptured ectopic with hemoperitoneum who underwent laparotomy. In second trimester, there were 17.8% cases. Majority of cases were of hemorrhage (26%) out of which, abruptio placentae (15.62%) followed by placenta previa (9.3%), placenta accreta (6.25%), placenta percreta (3.125%). Third trimester had 42.4% cases which had eclampsia (18.7%) and severe preeclampsia with jaundice (5.6%). Sepsis was seen in 9.8% cases. Respiratory distress in 4%, rupture uterus in 4% cases.

**Table 4: Distribution of maternal near miss cases according to religion**

Religion	Number N=123	Percentage (%)
Sikh	67	54.48
Hindu	50	40.65
Muslim	6	4.87

[Table 4] is showing the frequency and percentage distribution of women according to their religion. Majority of cases were Sikhs 54.48%, Punjab being a sikh dominated state.

**Table 5: Distribution of maternal Near miss according to Socioeconomic class (Kuppuswami Scale)**

Class	Number N=123	Percentage (%)
Lower	78	63.41
Upper Lower	24	19.51
Lower Middle	21	17.08

[Table 5] shows distribution of maternal near miss cases according to their socioeconomic status. Maximum number of women were recorded with lower socioeconomickuppuswami scale 63.41%, the reason being lack of money and resources and need for earning daily wages for sustaining life. This prevents them from visiting hospitals for antenatal care. They fail to avail government schemes due to

lack of education and awareness of government schemes on maternal and child health like JSSK, JSY, PMSMA.

**Table 6: Mode of delivery in near miss cases**

Mode of delivery	Number	Percentage (%)
Vaginal	20	24.7
Caesarean section	35	43.2
Laparotomy for rupture uterus/ hysterectomy	8	9.9
Laparotomy for ectopic	15	12.2
Classical caesarean	3	3.7

Eighty one near miss cases had delivered/ underwent caesarean section or laparotomy in our centre [Table 6], 24.7% patients had vaginal deliveries, 43.2% underwent Lower segment caesarean section, 9.9% underwent laparotomy for rupture uterus, 12.2% underwent laparotomy for ruptured ectopic pregnancy and 3.7% underwent classical caesarean section. Remaining 42 patients were referred from other centers due to postpartum hemorrhage, acute uterine inversion and non availability of blood bank and ventilator.

**Table 7: Distribution of maternal Near miss according to complication of pregnancy**

Complication Of Pregnancy	No. of Near miss cases N=123	Percentage (%)
Anaemia without hemorrhage	42	34.1
Hemorrhage	32	26
Eclampsia	23	18.7
Sepsis	12	9.8
Liver disease	7	5.7
Rupture uterus	5	4
Respiratory disease	5	4
Obstructed labour	4	3.2
Heart disease	2	1.6

[Table 7] shows distribution of near miss according to complication of pregnancy. Most common direct complicating factor being hemorrhage 26%, eclampsia 18.7%, sepsis 9.8%, rupture uterus 4% (rupture uterus was present in 2 cases of grandmultipara and 3 cases had more than 2 previous LSCS) and obstructed labour 3.2%. Among the indirect causes anaemia 34.1% was leading cause. Out of this iron deficiency anaemia was seen in 88% cases and 12% cases had other types of anaemia like megaloblastic and thalassemia minor. Respiratory disease 4%, liver disease 5.7% (mainly hepatic encephalopathy) and heart disease 1.6% (1 patient had dilated peripartum cardiomyopathy and 1 patient was revived from sudden cardiac arrest). (The total for this table is not 123 as a single patient had more than one complication of pregnancy.)

## DISCUSSION

Maternal Near miss is defined as woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of

termination of pregnancy. About 80% of maternal deaths are due to direct causes i.e. obstetric complications of pregnancy, labor and puerperium or inappropriate and inadequate interventions, treatment and/or referral. Remaining 20% of maternal deaths are due to indirect causes like, the result of pre-existing diseases or disease that developed during pregnancy which are not due to direct obstetric cause but are aggravated by the physiological cause of pregnancy. The study conducted for a period of one and a half year included 123 patients categorized at maternal near miss who reported to the labour room of department of Obstetrics and Gynecology, Govt. Medical College, Patiala. In the present study, out of 6166 deliveries, there were 5461 live births and 123 maternal near miss cases, which were included based on WHO 2010 maternal near miss approach. Number of maternal deaths in the study period was 65. Hemorrhage being the number one cause of maternal death 32.3% followed by anaemia without hemorrhage contributing to 20% of maternal deaths. Hypertensive disorders 16.9%, respiratory disorders and heart disorders 4.61%, liver disorder 7.69%, obstructed labour or rupture uterus 6.15% and sepsis contributing to 7.69% of maternal deaths.

Mean age of patients was 25.8 years. Maximum number of patients were between age group of 21-35 years i.e. 96%. A study done in Coimbatore also had a similar result of maximum patients falling under age group 21-30years (75%).<sup>[7]</sup>

The parity distribution of our study is as follows: 31.7% were primipara and 68.3% multipara cases. Study by Rajakumari at Coimbatore also showed that maximum patients were multipara 59% and primipara were 41%.<sup>[7]</sup> Our results also matched with study by Bansal et al,<sup>[8]</sup> which had multipara 64.1% and primipara 35.89%.

The number of cases of near miss were more in third trimester i.e. 42.4% comparable to Rajakumari et al,<sup>[7]</sup> which had 33.6% in third trimester and Bansal et al,<sup>[8]</sup> 56.41% in third trimester. Roopaet al,<sup>[9]</sup> and Bashour et al,<sup>[10]</sup> also had similar results of 43.6% and 43.2% respectively.

The maternal near miss incidence ratio (MNMR) in present study is 22.5. Literature reports the similar trends and MNMR varies between 15 to 40 per 1000 live births.<sup>[11,12]</sup>

Maternal near miss to mortality ratio is 1.89: 1 in the present study, which means for every 2 lives saved there was 1 maternal death. The ratio is similar to a study conducted in Bastar district of Chhattisgarh, India which had near miss to mortality ratio of 2:18. Study of near miss morbidity done in western Rajasthan also had a near miss mortality ratio of 2:1.13 Our results are also similar to those of African countries where range is 2-11:1.14 A study conducted in Coimbatore, India showed a maternal near miss mortality ratio of 20.21:17 which is very high and shows a very good level of maternal care.

Mortality index for various primary complication of pregnancy was calculated and number one cause was hemorrhage in 39.6% cases, followed closely by respiratory diseases in 37.5%, hypertensive disorder in 32.3% cases, liver diseases in 31.7% and sepsis in 29.4% cases. A study conducted in Bastar district of Chhattisgarh by Bansal et al,<sup>[8]</sup> reported hypertensive disorders in 31.57% cases followed by sepsis and severe anaemia in 15.78% and hepatitis in 66.67% cases. The study conducted by Kalra et al,<sup>[13]</sup> reported hemorrhage as leading cause of maternal mortality in 62.9% cases, sepsis 40.7% as second common cause followed by hypertension in 11.1%, rupture uterus in 7.4% and medical complications 5.5% cases. Taly et al,<sup>[15]</sup> reported hemorrhage 60% and hypertension 34% as leading causes of maternal death followed by sepsis 4% at number three.

The most common direct cause for maternal near miss in our study was hemorrhage 26% cases, hypertensive disorders 18.7%, sepsis 9.8%, rupture uterus and respiratory disorders 4% each. Liver disorders contributed 5.7% cases. Most common indirect cause was anaemia without hemorrhage 34.1%. Study by Bansal et al,<sup>[8]</sup> also reported hemorrhage as most common complication of pregnancy leading to maternal near miss, which matched our study. Anaemia and rupture uterus was reported in 15.38% cases, hypertensive disorder in 12.38%, liver disorder in 2.56% cases. Similar results were reported by Kalra et al,<sup>[13]</sup> hemorrhage 56% as leading cause of maternal near miss followed by hypertension 17.8%, sepsis 5.35%, rupture uterus 8.92% and medical complications 11.6%. Study by Rajakumari et al,<sup>[7]</sup> reported hypertensive disorder as most common cause for near miss contributing to 45.7% cases, hemorrhage 26.64%, anaemia 10.6%, sepsis 5.6% and heart disease 4.6% cases. Taly et al,<sup>[15]</sup> reported hemorrhage 60% as number one cause followed by hypertensive disorder 34%, sepsis 4% and rupture uterus in 5% cases.

The management of anaemia at our centre was done by first of all identifying the type of anaemia by complete blood counts and peripheral blood films and treating it accordingly. Out of these majority 37 (88%) patients had severe microcytic hypochromic picture referring to iron deficiency anaemia and 5 (12%) had other types of anaemia like megaloblastic anaemia and thalassemia minor. There was no case of thalassemia major. The mainstay of treating severe anaemia was blood transfusion in our study. In megaloblastic anaemia, injection cyanocobalamin, folic acid and nicotinamide (vitcofol) was also given along with blood or iron transfusion. Foremost step of prevention of anaemia is good antenatal care and regular intake of iron and folic acid tablets by patients. Haemoglobin electrophoresis to rule out thalassemia and sickle cell anaemia should be done in all antenatal patients.

## CONCLUSION

The most common direct cause for maternal near miss is hemorrhage. Although hemorrhage is the leading cause of maternal death worldwide but postpartum hemorrhage is highly unpredictable and poses a major challenge to obstetricians. Eclampsia and severe preeclampsia are one of the easiest identifiable and avoidable factors for preventing maternal death. Regular blood pressure monitoring at every antenatal visit along with urine complete examination for sugar and albumin serves as a baseline marker and can predict about the state of patient. Urine dipsticks should be made available at all levels of health care facilities starting from base of staircase i.e. Primary health centre and upto tertiary level centre. Health care providers like ASHA workers and ANMs who have first contact with the antenatal women should be trained to tally and read the dipstick test results and inform the doctor accordingly. Likewise magnesium sulphate should be available at all levels of healthcare and doctors should be taught about giving loading dose. Crux is, stress should be given on institutional delivery under all aseptic conditions. Also, the abortifacient drugs should not be available over the counter and should be given under expert supervision.

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