Analysis of Various Factors Associated with Maternal Near Miss in Karachi Sindh

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ABSTRACT

Objective: To determine the factors associated with maternal near-miss in booked patients managed at tertiary care hospital.
Study Design: Comparative cross-sectional study.
Place and Duration of Study: Department of Obstetrics and Gynecology, Combined Military Hospital Malir Cantt from Jun 2019 to Jul 2021.
Methodology: A total of 198 pregnant women of were included in the study. All the women were followed until delivery, and data was collected for near maternal miss and types of complications. Relationship of the age of study participants, gestation, parity and presence of comorbid medical illnesses were analysed with maternal near-miss in our study participants.
Results: Out of 198 pregnant women included in the study, 168 (84.8%) did not have near-miss, while 30 (15.2%) had experienced at least one near-miss. The mean age of the women included in our study was 29.236 ± 2.45 years. Cardiovascular complications 14 (7.1%) were the most common in our study participants, followed by renal complications 8 (4.1%). The second and third trimesters and the presence of medical comorbidities were statistically significantly associated with near-miss (p-value <0.05).
Conclusion: Near miss was a fairly common finding in booked pregnancies managed at our hospital. Women in the second or third trimester of pregnancy and those with any medical conditions had more chances of having near-miss than those in the first trimester or without any medical comorbidities.

Keywords: Complications, Gestation, Maternal near-miss.

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INTRODUCTION

Maternal "near-miss" can be defined as an acute organ system dysfunction, which may result in severe consequences, including death if not treated in time.[1] Lower and middle-income countries have high maternal mortality rates due to several administrative and financial reasons.[2,3]

Morbidity statistics could not be reflective of nearmiss statistics as near-miss events occur with higher frequency than mortality events. Quality of life statistics seem to be affected by near-miss events among pregnant women.[4] Safe motherhood programs could not work efficiently if morbidity data is not collected and analyzed.[5] Upadhaya *et al*, conducted a study in 2017 and found that the prevalence of near-miss events in pregnant women is around 2.3%.[6] Maternal near-miss rate is another term which is a ratio between the number of maternal near-miss cases to live births. It is very useful in determining the efficiency of health care facilities. Rana *et al*, did a study in 2013 from data of Nepalese patients and concluded that showed maternal near-miss rate in their study population was 3.8 per 1000 live births.[7]

Shrestha *et al*, showed in their study that the frequency of maternal near-miss was 7.5% in booked patients at tertiary care hospitals.[8] Ansari *et al*, showed in another study that the frequency of maternal near-miss was 14% in booked patients at tertiary care hospitals.[9] Although maternal mortality is extensively reviewed in Pakistan, data on factors associated with maternal near-miss is limited. We, therefore, planned this study with the rationale to determine the factors associated with maternal near-miss in booked patients managed at our tertiary care hospital.

METHODOLOGY

This comparative cross-sectional study was planned and conducted at the Department of Obste-trics and Gynecology, Combined Military Hospital (CMH) Malir Cannot from June 2019 to July 2021. The sample size was calculated using the WHO sample size calculator using the population prevalence proportion of maternal near-miss as 14%.[10] Non probability consecutive sampling technique was used to recruit the sample

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for this study. The Ethical Committee gran-ted ethical approval via letter number 59/2019/Trg/ ERC.

Inclusion Criteria: All the pregnant women between 18 and 35 years of age who were managed as booked cases at CMH Malir Cantt during the study period were included in the study.

Exclusion Criteria: Women who were classed as high-risk pregnancies at the first visit or those with twin or multiple pregnancy were excluded from the study. Women with severe haematological or autoimmune disorders or those taking steroids or cytotoxic medications, women with known psychiatric illnesses or those using illicit drugs were also excluded from the study.

Un-booked patients diagnosed as near maternal miss or booked cases losing follow-up were not included in the final analysis. Patients fulfilling the inclusion criteria from the Department of Obstetrics and Gynecology of Combined Military Hospital, Malir, were included in the study. Demographic information of patients (name, age, parity and gestational age) was taken. All the study participants were included after full assurance of confidentiality and written informed consent.

All the women were followed until delivery, and data was collected for maternal near-miss and type of complications on especially designed proforma. A maternal near-miss was defined as a pregnant woman who survived any of the peripartum or 42 days' postpartum complications as assessed by the World Health Organization criteria.[11] A booked case was defined as when a pregnant lady has had a minimum of three visits for an antenatal check-up after she was registered and confirmed pregnant by laboratory test.[12]

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Frequency and percentage were computed for qualitative variables like age groups, parity, maternal near-miss and type of complication. Mean ± SD were computed for quantitative variables like age and gestational age. Association of various factors with maternal near-miss was established using the chi-square test. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

A total of 198 booked pregnant women were included in the study. Of these, 168(84.8%) women did not have any near miss, while 30(15.2%) experienced at least one near miss. The mean age of the women included in our study was 29.236 ± 2.45 years. Table-I summarized the general characteristics of the study participants.

Table-I: Characteristics of study participants.

Study Parameters	n (%)
Age (Years)	
Mean ± SD	29.236 ± 2.45
Range (min-max)	20 - 35 years
Gestational Age (weeks)	
Mean ± SD	36.639 ± 2.54
No	168 (84.8%)
Yes	30 (15.2%)
Complications	
Cardiovascular dysfunction	14 (7.1%)
Renal dysfunction	8 (4.1%)
Coagulation dysfunction	8 (4.1%)
Eclampsia	5 (2.5%)
Uterine dysfunction	5 (2.5%)
Hepatic dysfunction	2 (1.1%)
Death	2 (1.1%)
Neurological dysfunction	1 (0.5%)
Respiratory dysfunction	1 (0.5%)
Others	1 (0.5%)

The mean gestational age of our study participants was 36.639 ± 2.54 weeks. Cardiovascular complications (14,7.1%) were most common in our study participants, followed by renal complications (8,4.1%). Neurological (1,0.5%) and respiratory (1,0.5%) complications were least reported in our study participants.

Table-II showed that the second and third trimesters of pregnancy (*p*-value<0.001) and the presence of medical comorbidities (*p*-value-0.003) were statistically significantly associated with a near miss (*p*-value<0.05). At the same time, age (*p*-value-0.283) and parity (*p*-value-0.547) had no association with a near-miss in our population.

Table-II: Comparison of pain relief at different time intervals in both groups.

Factors	No Maternal Near Miss	Maternal Near Miss	*p*-value
Age			
18-25 years 25-35 years	85 (50.6%) 83 (49.4%)	12 (40%) 18 (60%)	0.283
Gestation			
First trimester Second and third trimester	84 (50%) 84 (50%)	01 (3.3%) 29 (96.7%)	<0.001
Parity			
Primiparous Multiparous	63 (37.5%) 105 (62.5%)	13 (43.3%) 17 (56.7%)	0.547
Presence of comorbidities			
No Yes	146 (86.9%) 22 (13.1%)	19 (63.3%) 11 (36.7%)	0.003

DISCUSSION

We found that near-miss was a fairly common finding in booked pregnancies managed at our hospital. Women in the second or third trimester of pregnancy and those with any medical conditions had more chances of having near-miss misses than those in the first trimester or without any medical comorbidities.

Several indices can evaluate the quality of obstetric care provided by health care facilities. In recent years, maternal near-miss or morbidity statistics have gained more importance. Cause of mortality, morbidity or near miss may be similar, but the prevalence of near-miss events is relatively high compared to mortality indices. The overall efficiency of service may be evaluated in maternal near-miss events. In order to make the service more efficient, epidemiological data regarding near-miss events and their outcome should be gathered and published.[12,13]

Around 15% of total deliveries in our hospital showed the presence of near-miss events. A similar study conducted in India showed that 2.3% of their deliveries had one or more near-miss events.[6] This rate was 3.8 per 1000 live births in a study performed by Rana *et al*, in 2013 on pregnant women of Nepal.[7] Differences can be explained by the type of setting and level of the hospital. Shrestha *et al*, showed in a study that the frequency of maternal near-miss was 7.5% in booked patients at tertiary care hospitals.[8] Ansari *et al,* has showed in another study that the frequency of maternal near-miss was 14% in booked patients at tertiary care hospital.[9] Reason for high numbers in our study may be our hospital catering for a lot of rural Sindh population living a compromised life.

The maternal near-miss rate is quite a widely used indicator to assess the level of care provided by the obstetric facility. It is defined as the number of maternal near-miss cases to live births.[10] Studies from Karachi and neighbouring country India showed maternal near-miss rate was around 16.6 to 31.4 per 1000 live births.[14,15] Multiple factors may be responsible for these increased figures, including hospital setting and geographical location.

Owolabi *et al,* conducted a large cross-sectional study comprising data from 54 hospitals in Kenya and concluded that maternal near-miss events occurred at 7.2 per 1,000 live births.[16] Our study revealed that around 15.2% of participants had experienced at least one near-miss event during pregnancy. The difference in results may be due to our recruitment of patients from a single hospital that caters to the rural population of Sindh. Multiple life-threatening events were seen in our study involving various systems. Two deaths were also reported. A similar pattern of life-threatening events was seen in maternal near-miss cases in studies from other parts of the world.[17,18] This indicates that there is so much room for improvement in antenatal care by making early diagnoses of near-miss events and high-risk cases, especially those with medical comorbidities and in later trimesters of pregnancy.

This study gave an insight into the epidemiology of near-miss in our population. Clinicians having an idea of high-risk cases would allow them to screen the population and prevent severe obstetric consequences.

LIMITATIONS OF STUDY

There were a few limitations in our study. Studying only booked cases generates data that may represent the real problem regarding near-miss events. Future studies with a population-based study design or recruiting patients from multiple centres may generate better results.

CONCLUSION

Near miss was a fairly common finding in booked pregnancies managed at our hospital. Women in the second or third trimester of pregnancy and those with any medical conditions had more chances of having near-miss misses than those in the first trimester or without any medical comorbidities.

Conflict of Interest: None.

Author's Contribution

BS: Concept, design of study, sata collection, analysis and interpretation, drafting the article, AR: Concept and design of study technical assistance, final approval to be published, RS: Analysis and interpretation, drafting the article, MA: Data collection, peer review, technical assistance, UI:, SG: Peer review , technical assistance.

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