

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20220890>

Original Research Article

An analysis of the levels of delay seen in maternal near miss cases in India

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Received: 13 January 2022

Revised: 12 February 2022

Accepted: 14 February 2022

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ABSTRACT

Background: The measure of progress of maternal health has usually been a reduction in maternal mortality but if you look at maternal health as an iceberg – maternal deaths are only seen as the tip, with maternal morbidity as the base. As for every woman that dies of maternal causes, 20-30 others experience severe maternal morbidity, sometimes with permanent consequences affecting their daily functioning.

Methods: We conducted a prospective observational and clinical study at D. Y. Patil Hospital in Navi Mumbai, India from November 2018 to October 2020 from critically ill, pregnant, laboring, post-partum or post-abort women that were admitted to the hospital and the levels of delay and barriers to health were carefully asked from the proforma and tabulated.

Results: The most common cause of delay was delay 1 in 48.6% cases followed by delay 2 in 31.9% patients. 18.1% patients had no delay noted followed by 1.4% patients that had a level 3 delay. This study found significant association with antenatal care with type of delay experienced during maternal near miss. Women that had not taken appropriate antenatal care in pregnancy had a higher association to type 1 delay.

Conclusions: We have learnt that social determinants are important contributors to the causes of near miss delays and eventual maternal mortalities and these social determinants depend on many social levels. Addressing maternal deaths requires action at every level, not just medical or health services. Understanding the delays in receiving care helps analyze patterns of maternal near miss cases and consequently maternal deaths.

Keywords: Maternal morbidity, Near miss, Maternal mortality, High risk obstetrics

INTRODUCTION

The fifth millennium development goals and national rural health mission only mentions and works for improving the maternal mortality.

Worldwide maternal mortality is unacceptably high and most of these causes of death are preventable.

The measure of progress of maternal health has usually been a reduction in maternal mortality but if you look at maternal health as an iceberg – maternal deaths are only seen as the tip, with maternal morbidity as the base.

As for every woman that dies of maternal causes, 20-30 others experience severe maternal morbidity, sometimes with permanent consequences affecting their daily functioning.

These sequelae can affect women's physical, mental or sexual health, their ability to function in certain domains (e.g. cognition, mobility, participation in society), their body image and their social and economic status.¹

Reviewing of near miss cases has the potential to highlight deficiencies as well as positive findings in the provision of obstetric services in these cases.

These near miss reviews can serve as a vital tool to improve quality of care at health facilities especially in developing countries like a proxy model of maternal death.

A World Health Organization (WHO) model focusses on the three main factors that affect the out- come of emergency presentation during pregnancy.²

These factors were defined, chronologically, as the lengths of the delays in: the decision to access care; the identification of – and transport to – a medical facility; and the receipt of adequate and appropriate treatment.

Socioeconomic and cultural factors, accessibility of facilities and quality of care may independently affect the lengths of these three delays.

This so-called three-delay model illustrated that maternal mortality was not due solely to a lack of economic and human resources but was a product of numerous interwoven factors.

A poor patient outcome is likely to result if any of these factors contribute to an undue delay.

Additionally, in various cultures, women's status can affect both the ability of women to decide to seek care and their subsequent ability to reach care.

It has been estimated that 74% of maternal mortality could be averted if all women received appropriate emergency obstetric care.³

Although general emergency health involves a vast array of etiologies, there are relatively few conditions that, if left untreated, frequently and rapidly progress to death.

Level 1 delay – delay in seeking care

Delay one occurs when women themselves do not recognize the signs of life threatening conditions and miss the opportunity of receiving lifesaving care.

Some of the reasons patients postpone seeking care are lack of knowledge of warning signs, societal and cultural factors, socio-economic reasons, distance, lack of trust in healthcare, cost and others.

Any slowness in the recognition of a potentially severe condition will decrease the likelihood that appropriate care will be provided in a timely and effective fashion.⁴

Knowledge of communities and families of warning signs or signs of life threatening complications can be improved through health promotion activities aimed at the communities and antenatal women themselves. Improved knowledge about warning signs and a proper explanation to their instinct that something is wrong could decrease pregnancy related morbidity and mortality by early

recognition of complications and increasing the likelihood of prompt seeking of medical care.

At this critical juncture the ability of family influence and birth attendant to make timely and informed emergency care decisions could be lifesaving.

Financial and socio-cultural barriers also prevent women from seeking the care they need even when they understand the severity of their situation.

This however can be changed by arming women and societies with information and knowledge about pregnancy and community health care along with asking for support for them financially from the health ministry.

Hence if communities recognize danger signs and see them as life threatening conditions that can however be treated at hospitals they will be able to find ingenious ways to overcome distance and lack of transportation.

The patient's or caregiver's perception of the quality of care that the patient will receive does seem to have a strong effect on their decision to seek care.⁵

These findings have been recently validated, for all types of emergencies, among communities in rural Kenya and Zambia.⁶

Level 2 delay – delay in reaching care

The distance separating potential patients from the nearest health facility (including lack of transport) has been shown to be an important barrier to seeking health care.

The magnitude of the importance of this distance and or lack of transport on seeking timely care is however shaped by other factors such as the perceived severity of maternal condition and effectiveness of treatment (feeding in from a level 1 delay).

In a few cases however, the perception of severity of illness and quality care appears to be far greater than the distance and motivates family to do whatever it takes to get timely care even carrying women on makeshift stretchers for kilometers at a stretch.

Even in low resource settings, effective pre-hospital care improves survival of the mother by decreasing the time to treatment.

Community based first responders can be used effectively to provide emergence care as well.

If care delays are to be minimized, the individuals who provide pre-hospital services need to be able to identify the level of care that a patient requires and to take the patient directly to the nearest facility that offers that level of care.⁷

The objective of this study was to review near miss cases and see if this review has the potential to highlight the level of delay noted in receiving quality obstetric care while highlighting deficiencies as well as positive findings in the provision of obstetric services in these cases.

METHODS

Study settings

We conducted a prospective observational and clinical study at D. Y. Patil Hospital in Navi Mumbai, India from November 2018 to October 2020 from critically ill, pregnant, laboring, post-partum or post-abort women that were admitted to the hospital if they fit in the Government of India maternal near miss review operational guidelines.⁸

Selection criteria

The cases were identified as near miss category if the following criteria (minimum three from each category) were met: clinical findings; investigations; interventions or any single criteria that include cardio respiratory collapse.

In the duration of the study there were 6263 live births noted in the 8864 antenatal registrations. There were 19 maternal deaths and 138 maternal near miss cases according to the Government of India near miss guidelines.

Procedure

The study was started after institutional ethics committee approval. Cases were selected from critically ill, pregnant, laboring, post-partum or post-abort women that were admitted to the hospital in the emergency room, labour room or even directly to the intensive care unit (ICU). As this was a prospective study, these cases were followed closely from admission until discharge including case history, daily case notes, investigations and vital parameters and documented in the MNM-R proforma released by the Government of India. The adverse events in each category were identified and elaborated on. The levels of delay and barriers to health were carefully asked to the patient and relatives from the proforma and tabulated as follows.

Patients that did not give consent, maternal mortalities and women that suffered accidents were excluded from the study.

Statistical analysis

The collected data were transformed into variables, coded and entered in Microsoft excel. Data were analyzed and statistically evaluated using statistical package for the social sciences (SPSS)-PC-20 version.

Quantitative data was expressed in mean \pm standard deviation while qualitative data were expressed in percentage. Statistical difference between the proportions was tested by Chi square test or Fisher's exact test. 'P' value less than 0.05 was considered statistically significant.

RESULTS

The mean age at near miss incident was 27.71 ± 5.22 years. 39.1% were between 26-30 years.

Table 1: Demographic data of near miss cases (n=138).

Variables	No.	%
Age group (years)		
18-20	11	8.0
21-25	40	29.0
26-30	54	39.1
31-35	21	15.0
36-40	11	8.0
>40	1	0.7
Educational status		
Illiterate	17	12.3
Upto 5 th class	61	44.2
6 th -12 th class	55	39.9
Graduate and above	5	3.6
Gravidity		
Primigravida	10	7.2
Multigravida	128	92.8

The most common cause of near miss cases is hemorrhage (38.4%) followed by hypertensive disorders of pregnancy (34.1%).

Type of delay in near miss cases

The most common cause of delay was delay 1 in 48.6% cases followed by delay 2 in 31.9% patients as shown in Table 2.

18.1% patients had no delay noted followed by 1.4% patients that had a level 3 delay.

Table 2: Type of delay in near miss cases (n=138).

Type of delay	No.	%
None	25	18.1
1	67	48.6
2	44	31.9
3	2	1.4

Association of antenatal care with type of delay with antenatal care

This study found significant association with antenatal care with type of delay experienced during maternal near

miss, as shown in Table 3. Women that had not taken appropriate antenatal care in pregnancy had a higher association to type 1 delay. Women taking appropriate antenatal care had a higher chance of having no delay, delay 2 or delay 3.

Table 3: Association of ANC care with type of delay.

Type of delay	Taken		Not taken		P value
	No.	%	No.	%	
None	23	27.4	2	3.7	<0.01
1	26	31.0	41	75.9	
2	33	39.3	11	20.4	
3	2	2.4	0	0.0	

DISCUSSION

Women face multiple delays when seeking and receiving lifesaving care when they need it.

Such delays lead to an increased incidence of life threatening conditions and sometimes death.

The most common reported type of delay in our study was a type 1 delay 1 in 48.6% cases followed by delay 2 in 31.9% patients.

18.1% patients had no delay noted followed by 1.4% patients that had a level 3 delay.

This is contrasting to a study in Kerala⁹ where they identified the most common delay in accessing adequate care.

This included delay in recognition of potentially life-threatening conditions that occurred even after reaching health-care facilities.

These centers did not have specialist workforce, infrastructure, and blood transfusion services. There was perceptible delay in making the decision to refer cases to a higher center.

This is comparable to a study conducted in Liberia by Lori and Starke in 2011, which observed that out of 120 near misses, a delay in the recognition of obstetric complications among women, family members and community members including traditional midwives was the most common in the data when examining for each delay.¹⁰

A total of 45 women with near-miss events (38%) experienced this delay.

Seventeen women with near-miss (15%) experienced some delay in transfer to a health facility including difficulty in finding money for transportation, living in remote villages with no transportation available and seeking assistance during the night when people did not

want to travel on unsafe roads.

Providing and receiving timely care was not seen as a problem among participants experiencing a near-miss event with only four cases (3%) identifying delay at the facility as a barrier.

Eleven women (9%) with near-miss events experienced more than one delay in reaching the referral facility.

In a study conducted by Jitesh in northern Kerala found that out of 30 near misses, second and third delays were the most common, accounting for 19 cases (63.33 %) respectively. Seventeen had more than one type of delay.¹¹

Similarly to our study, a national study done in Brazil concluded that delay related to health service accessibility occurred most frequently (34.6%), followed by delay related to quality of medical care (25.7%), while delay related to user factors was observed in 10.2% of the records.¹² Most delays in health service accessibility were related to difficulties in obtaining antenatal care, since more than 30% of women were categorized as receiving absent or inadequate antenatal care (8.2% of all women had no antenatal care visit). Delay in seeking health care and refusing treatment was more frequent when related to user factors, while problems in antenatal care was the most prevalent component of delay in health service accessibility. For delay related to quality of care, the most important component was improper patient management, followed by difficulty in communicating with the regulatory centre and delay in starting treatment.

Limitations

Our study was limited as our sample size was small and based only out of one hospital, especially to estimate the frequency of delay in each of the three stages. As this was a hospital-based study, all mothers were not followed up through their postpartum period after discharge from hospital. However one of the strengths of this study was that an audit of near miss cases was less threatening to healthcare providers.

CONCLUSION

Addressing maternal deaths requires action at every level, not just medical or health services. Analyzing the levels of delay in maternal near miss cases helps understand larger patterns of severe morbidity and maternal mortalities. This study advances understanding in delays in maternal morbidity and also mortality as it shows a higher preponderance of social factors associated in accessibility of healthcare, therefore it is recommended that health education, dispelling of myths and increasing accessibility to primary healthcare including antenatal services can help reduce maternal near miss cases. This can be from improving education in the low socioeconomic areas, reducing the cost of quality healthcare, improving access and lowering barriers to healthcare access and most

importantly empowering women and families with knowledge about warning signs in pregnancy and proper antenatal care.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Reichenheim M, Zylbersztajn F, Moraes C, Lobato G. Severe acute obstetric morbidity (near-miss): a review of the relative use of its diagnostic indicators. *Arc Gynecol Obstet.* 2008;280(3):337-43.
2. Leigh B, Kandeh HB, Kanu MS, Kuteh M, Palmer IS, Daoh KS, Moseray F. Improving emergency obstetric care at a district hospital, Makeni, Sierra Leone. The Freetown/Makeni PMM Team. *Int J Gynaecol Obstet.* 1997;59:55-65.
3. Broccoli M, Calvello EJB, Twomey M, Wachira B, Wallis LA. 203 community based perceptions of emergency care in communities lacking formalized emergency medicine systems. *Ann Emerg Med.* 2014;64(4):73-4.
4. Nirula R, Maier R, Moore E, Sperry J. Scoop and run to the trauma center or stay and play at the local hospital: hospital transfer's effect on mortality. *J Trauma.* 2010;69(3):595-601.
5. Stein C, Mould-Millman NK, De Vries. Access to out-of-hospital emergency care in Africa: Consensus conference recommendations. *African journal of emergency medicine: Revue africaine de la medecine d'urgence.* 2016;6(3):158-61.
6. Chhabra P, Guleria K, Saini NK, Anjur KT. Pattern of severe maternal morbidity in a tertiary hospital of Delhi, India: a pilot study. *Tropical Doctor.* 2008;38(4):201-4.
7. Godoy S, Gualda D. Repercussions of near miss and womens perception of care received in the critical care unit. *Acta Paul Enferm.* 2009;22(2):162-8.
8. Ministry of Health and Family welfare. Maternal near miss review operational guidelines. National Health Mission. 2014.
9. Reena RP, Radha KR. Factors associated with maternal near miss: A study from Kerala. *Indian J Public Health.* 2018;62(1):58-60.
10. Lori JR, Starke AE. A critical analysis of maternal morbidity and mortality in Liberia, West Africa. *Midwifery.* 2011.
11. Jithesh V. Social determinants of maternal deaths and maternal 'nearmisses' in Wayanad district, Kerala: A qualitative study. Trivandrum: Sree Chitra Tirunal Institute for Medical Sciences and Technology, Achutha Menon Centre for Health Science Studies. 2012.
12. Pacagnella R, Cecatti J, Parpinelli M, Sousa M. Delays in receiving obstetric care and poor maternal outcomes: results from a national multicentre cross-sectional study. *BMC Pregnancy and Childbirth.* 2014;14:159.

Cite this article as: Chainani EG, Nandanwar YS. An analysis of the levels of delay seen in maternal near miss cases in India. *Int J Reprod Contracept Obstet Gynecol* 2022;11:1122-6.