Original Research

BARRIERS IN ACCESSING EMERGENCY OBSTETRIC SERVICE : A PROSPECTIVE OBSERVATIONAL STUDY AT A TERTIARY CARE CENTRE

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ABSTRACT

Introduction: Despite a drastic reduction in maternal mortality rate, India still contributes to 12% of global maternal deaths. Multiple factors influence access to quality emergency obstetric care that is timely, effective, efficient, equitable, evidence, and client-centric. The present study was carried out to determine the factors influencing access to emergency services by obstetric patients using the Three Delay Model. **Methods:** This was a prospective, observational, single-center study conducted in the Department of Obstetrics and Gynaecology at a tertiary care hospital from June 1st, 2021 to 31st July 2021. All Pregnant and Postpartum patients admitted from the emergency room were included. A predesigned proforma was used to record the reasons for the delay in receiving emergency care at the time of admission. **Results:** More than three-fourths of women (75.64%) had a delay of more than four hours from the onset of symptoms to the arrival at the emergency room. Out of these, the majority had Level 1 delay, i.e., there was a delay in deciding to seek care, most commonly due to unawareness of danger signs. The most common reason for level 2 delay, i.e., delay in reaching the facility was the refusal of admission/care at a center visited before reaching our facility. **Conclusion**: Three-delay model is an effective bottleneck assessment tool for understanding the reasons for delay in receiving emergency obstetric care. For minimizing level 1 delays, strengthening patient education and counseling in the antenatal clinics and engagement of family members in the counseling about the danger signals is important.

Keywords: Emergency service, tertiary care center, three-delay model, obstetric care

Introduction:

With the advent of the National Health Mission (NHM) in 2005-06, there has been a remarkable reduction in maternal mortality ratio and infant mortality rates in India. The maternal mortality ratio reduced from 556 per 100,000 live births in 1990 to 97 per 100,000 live births in the year 2018-20. Similarly, Infant Mortality Rate (IMR) has also declined from 86 infant deaths per 1000 live births in 1990 to 35.2 per 1000 live births in 2018-20(Ministry of Finance, Government of India, 2023). The average annual rate of reduction (ARR) in global MMR during the 2000–2017 period was 2.9%, compared to India's ARR of 6.15% in 2015-17(Ministry of Health & Family Welfare, Government of India, 2020)

Despite this drastic reduction in MMR, India still contributes to 12% of global maternal deaths(Ministry of Health & Family Welfare, Government of India, 2020). Pregnancy-related mortality and morbidity continue to have a huge impact on the lives of Indian women and their newborns. Reducing maternal and child mortality is a key priority for improving population health outcomes, the provision of Universal Health Coverage, and achieving health-related targets of the Sustainable Development Goals (SDGs). The government of India has introduced several new interventions such as SUMAN, Midwifery, PMSMA, and LaQshya to further improve the key maternal and newborn health indicators (Ministry of Finance, Government of India, 2023). These initiatives focus on improving the Quality of Care during the ante-partum, intra-partum & and post-partum periods. A key challenge that remains is to overcome the lack of access to comprehensive, high-quality obstetric care services across public health facilities. There are multiple factors that influence access to quality emergency obstetric and newborn care that is timely, effective, efficient, equitable, evidence and client-centric.

The three Delays Model (Thaddeus and Maine ,1994), originally developed in the context of maternal mortality, provides a useful framework to examine factors influencing the timeliness of care. It contains 3 critical levels of delays. Level I is a delay in decision by an individual or family to access emergency obstetric services. Level II is delayed in reaching adequate health facilities. Level III is a delay in receiving appropriate emergency obstetric care at a health facility. This model has been used widely in India and worldwide for analysis of reasons of maternal deaths, and even neonatal mortality.

There is a paucity of data regarding the factors leading to delays in receiving adequate and timely emergency obstetric care at tertiary-level facilities in India. The present study is unique and the three-delay model was applied to all the obstetric admissions from the emergency room. To the best of our knowledge, no such study has been done on the Indian population till now.

Methods

This is a prospective, observational, single-centre study conducted in the Department of Obstetrics and Gynaecology at a tertiary care hospital attached to a Medical College in Delhi from 1st June 2021 to 31 July 2021.

All Pregnant and Postpartum patients admitted from the emergency room of the Department of Obstetrics and Gynaecology during the study period were included. Patients admitted for non-obstetric conditions and those called for planned admission were excluded. Ethical clearance was taken from the institutional ethical committee (LHMC/IEC/2021/03/59). It was proposed to do the study over a fixed duration of time and all the women who got admitted from the emergency room during the study period, fulfilling the inclusion and exclusion criteria were enrolled in the study; so sample size calculation was not applicable.

A predesigned proforma was used to record the reasons for the delay in receiving emergency care. Written informed consent was obtained from all the patients willing to participate in the study. Level 1 and Level 2 were defined if the time between the onset of symptoms and reaching the facility was more than four hours. Level 3 delay was defined as a delay of one or more hours from the decision of admission to getting a bed (3A) or between the arrival of the patient at the emergency room and being attended by the doctor on duty (3B). Data was entered in MS Excel and analyzed by SPSS version 20. Data is presented as mean, standard deviation, and percentage.

Results

During the study period, 739 patients were enrolled as study participants. Demographic details of the patients are depicted in Table 1. The majority of patients were in the age group 25-30 years (321/739, 43.43%) and were multiparous (463/739, 62.65%). About 43.03% (318/739) of our patients were illiterate by education status and 48.03% (355/739) belonged to the upper lower socioeconomic class by the Modified Kuppuswamy scale.

Table 1: Socio-demographic details of study population

Parameters	N	%
Age Distribution (YEARS)		
19-25	288	38.97
25-30	321	43.43
>/=30	130	17.59
Education		
Illiterate	318	43.03
Primary school	117	15.83
High school	149	20.16
Intermediate/diploma	105	14.20

Graduate	50	6.76
Socioeconomic Status		
Lower	59	7.98
Upper lower	355	48.03
Lower middle	207	28.01
Upper middle	110	14.88
Upper	08	1.08
Parity		
Nulliparous	256	34.65
Multiparous	463	62.65
Postpartum	20	2.70

Out of 739 patients, 525 (71.04%) were registered at our hospital with at least one prior antenatal visit and the rest 214(28.95%) were referred from other centers. About 409(55.28%) had less than four antenatal check visits during pregnancy and 330(44.72%) had four or more antenatal check visits. Nearly three-fourths of patients 76.99% (561/739) had one or more high risk factors complicating the pregnancy. The majority (417/739, 56.48%) of admissions were during day hours 8 am to 8pm as depicted in Table 2.

Table 2. Antenatal Factors

Parameter	N	%
Booking Status		
Registered	525	71.05
Referred	214	28.95
Antenatal Visits		
ANC Visits < 4	409	55.28
ANC Visits >4	330	44.72
Risk Group		
High Risk	561	75.97
Low Risk	178	24.04
Access To Obstetric Care		
Delay	561	75.91
No Delay	178	24.08
Admission Timing		
Day (8 am to 8 pm)	417	56.48
Night (8 pm to 8 am	322	43.52

The delay in reaching the hospital was observed in 75.64% of our women. The various levels of delays are depicted in Figure 1.

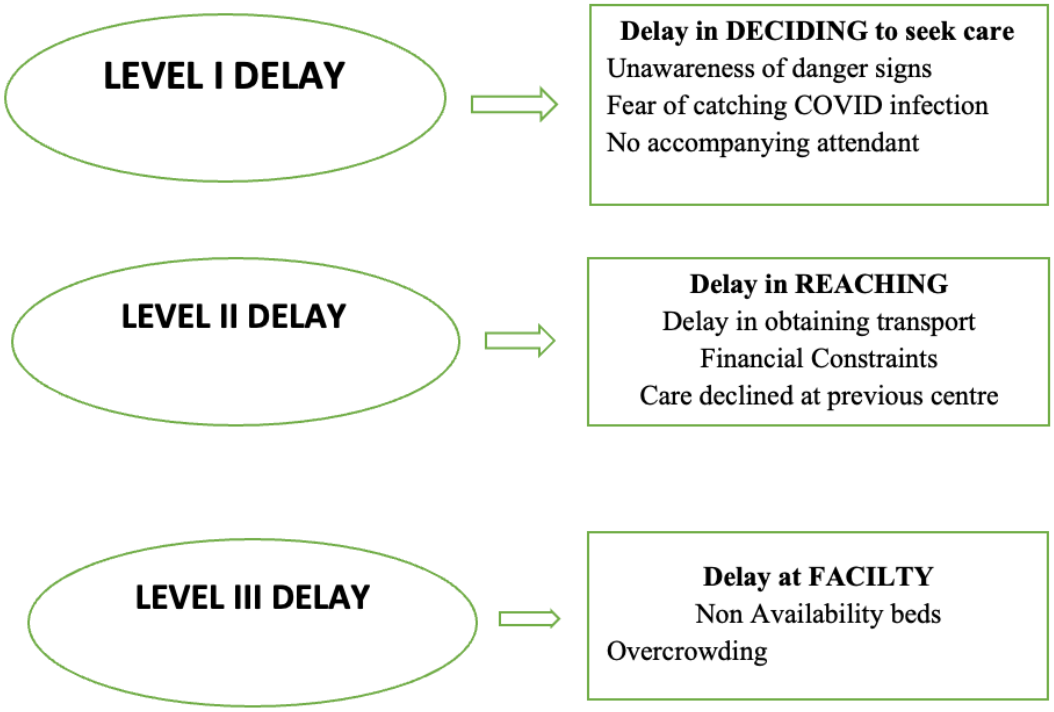

Figure 1: Framework of Maternal delays for obstetric care based on three delay model

The reasons are depicted in Table 3. Out of 561/739 (75.91%) women who had a delay in emergency admission, the majority had Level 1 delay and it was most commonly due to unawareness of danger signs (216/561, 38.5%). The most common reason for level 2 delay was the refusal of admission/care at a center visited before reaching our facility (112/561, 19.9%). A sizeable number of patients, unfortunately, experienced delays in receiving care even after reaching our facility due to overcrowding and a shortage of beds. The majority of women reported more than one reason for the delay.

Table 3: Type/ Reason for Delay

Type / Reason for Delay	N	%
Level 1 Delay: Delay in DECIDING to seek care		
1A: Unawareness of danger signs	216	38.5
1B: Fear of catching COVID infection	112	19.9
1C: No accompanying attendant	32	5.7
Level 2: Delay in REACHING		
2A: Delay in obtaining transport	32	5.7
2B: Financial Constraints	25	4.4
2C: Care declined at the previous center	112	19.9
Level 3: Delay at FACILITY		
3A No beds	17	3

3B: Overcrowding	15	2.6

Discussion

Childbirth-related complications leading to maternal and perinatal morbidity and mortality are way higher in developing countries (Wellington, 2017). The majority of these complications are preventable, but various factors hinder women's access to emergency obstetric services (Awel et al., 2022). Despite various initiatives by the government to improve Reproductive and Child Health (RCH) service delivery, access to quality emergency obstetric and newborn care remains poor. There are multiple factors contributing to the lack of access to timely and appropriate medical care, encompassing social, cultural, and financial domains. Multiple studies have been done worldwide (Awel et al.,2022;Ntambue et al.,2017; Behrane et al., 2019) and in our country (Ghumare & Padvi, 2018; Mahapatro, 2015) correlating these factors with maternal and perinatal deaths.

Pregnant women need timely and quality care, and the timing of childbirth is unpredictable; there is an utmost need to address the factors leading to delays in the emergency medical care that they need (Ministry of Health & Family Welfare, Government of India, 2020). Although the delay model (Thaddeus and Maine ,1994) has been used widely to determine the delays contributing to maternal near misses and deaths, there has been no study to evaluate the delays in accessing emergency obstetrics services.

It was found that more than three-fourths of the women getting admitted from our emergency room had a delay as defined. The majority of the patients (561/739,76.99%) admitted had one or more high-risk factors complicating the pregnancy. The most common reason for the delay in our study was Level 1 delay, that is delay in deciding to seek care, and the most common reason for this was unawareness of the danger signs indicating lack of provision of adequate counseling related to warning symptoms during pregnancy. Not only the doctors but the nursing staff and other frontline health care providers like Auxiliary Nurses and Midwife (ANMs), Accredited Social Health Activist(ASHA)workers, as well as the local Anganwadi workers) have an important role in preventing this aspect of delay. Women and their families must be sensitized time and again about the early detection of danger signs and the need to approach the health facility timely during antenatal check visits. Similar findings of delay in seeking care due to unawareness of danger signals have been reported in studies conducted to analyze maternal mortality by other authors (Murthy et al.,2013; Khandale & Kedar, 2017). The other factors contributing to Level 1 Delay may be attributed to various social and economic reasons. The delay in decision-making was observed in the majority of women probably because of illiteracy. Although the majority of the women in our study belonged to the upper lower class, the educational status and customs of spouse and family may also play a vital role in the decision to seek care (Sikder et al.,2015). As our study was done during the second wave of the COVID pandemic, fear of contracting infection also prevented a sizeable number of women from approaching the health facility. In a study conducted by Manu Goyal et al. at AIIMS, Jodhpur during the COVID pandemic about 33.4% of pregnant women had a delay in seeking care due to fear of catching COVID infections (Goyal et al., 2020). Another

major reason for the delay in deciding to seek care was non availability of a person to accompany the patient to the hospital.

Level 2 delay in our study was most commonly due to care being declined at a previous center. During the pandemic, many hospitals in our city (both private and public sector) were converted into COVID hospitals and their obstetric facilities were shut down (Dhiman et al.,2021). Although the inpatients in these hospitals at the time of conversion were referred to other hospitals, the pregnant women booked/registered at these centers were neither guided appropriately, nor a linkage was established with other centers. The existing referral linkage protocol in the city is also not robust. Timely referral of a high-risk antenatal woman is needed so that she can be booked at a tertiary care center in the antenatal period itself, rather than being referred in an emergency. Also, the lack of transport facilities, restrictions/lockdowns imposed due to the pandemic, and adequate finances for transport contributed in part, to the level 2 delays. Level 2 delay was seen much more frequently in our study compared to other studies (Bhattacharyya et al., 2015 and Jithesh & Ravindran, 2016) possibly due to COVID and our hospital being located in the heart of the city and easily accessible.

Level 3 delay, i.e. delay in receiving care, even after reaching the facility was also noted in a significant number of patients in our study. As our facility was catering to both COVID and non-COVID patients during the study period, the availability of beds in the designated area proved a challenge for pregnant women needing admission. Moreover need for maintaining separate zones for COVID-19 suspect, COVID-positive, and COVID-negative patients, further limited the number of beds. Unfortunately, many women had a delay in being attended in the casualty due to overcrowding. There was a shortage of manpower as many healthcare professionals were suffering from the infection (Dhiman et al.,2021). A meta-analysis on level 3 delay in developing countries (Knight et al., 2013) revealed various barriers in care: skilled health professionals (86%), availability of drugs/ other components (65%), staff shortages (60%), and low staff motivation (44%). Strengthening human resources is required to ensure that there is no delay in attending a patient once she has reached the facility. Adequately trained nursing and medical staff have to be posted to ensure timely delivery of quality care. Further, there is a need to strengthen the referral system, ensuring the availability of beds before referring a woman to another center.

Limitations of the study

As the study was done in COVID pandemic period, the results may not be a true reflection of the barriers and challenges in patients receiving emergency obstetric care. It is a single-centre observational study at a tertiary care hospital and hence the results cannot be generalized. There may be several other independent and sensitive factors affecting delay in seeking care that have not been taken into account.

Conclusion

The study concludes that the use of a three-delay model is an effective bottleneck assessment tool for understanding the reasons for delay in receiving emergency obstetric care at any facility. It provides insight into the barriers and challenges in providing timely and appropriate emergency obstetric care and interventions to circumvent the same. For minimizing level 1 delays, strengthening patient education and counseling in the antenatal clinics and engagement of the family members in the counseling about the danger signals is important. Spouses and family members need to be sensitized

about facilitating the timely arrival of the patient to the emergency room for optimization of outcomes. A well-planned, coordinated, and closed-loop referral system holds the key to preventing level 2 delays. The human resources in the emergency room need to be optimized either by task shifting or additional manpower based on the patient load to deliver timely and quality emergency obstetric care.

Conflicts of Interest

The author declares no conflicts of interest.

References

- Awel, S., Bagilkar, V.V., Fekecha, B. (2022). Delay in Reaching Institutional Delivery Service Utilization among Mothers Attending Jimma Medical Center, Ethiopia. Ethiop J Health Sci.,Jul;32(4):673-680. https://doi.org/10.1186/s12884-019-2307-6
- Berhane, B., Gebrehiwot, H., Weldemariam, S. et al. (2019). Quality of basic emergency obstetric and newborn care (BEmONC) services from patients' perspective in Adigrat town, Eastern zone of Tigray, Ethiopia. 2017: a cross sectional study. BMC Pregnancy Childbirth 19:190. https://doi.org/10.1186/s12884-019-2307-6
- Bhattacharyya, S., Issac, A., Rajbangshi, P. *et al.* (2015). "Neither we are satisfied nor they"-users and provider's perspective: a qualitative study of maternity care in secondary level public health facilities, Uttar Pradesh, India. BMC Health Serv Res 15, 421. https://doi.org/10.1186/s12913-015-1077-8
- Dhiman, N., Sethi, C.A., Gupta, S., et al.(2021). Challenges and navigating conundrums in setting up an obstetrics and gynecology coronavirus disease facility in a pre-existing tertiary care hospital – An Indian perspective. Indian J Med Sci., May 29;73(1):57–60. doi: 10.25259/IJMS_177_2020
- Ghumare, J.P., Padvi, N.V. (2018). Assessment of maternal deaths using three delay model at a tertiary care centre in rural Maharashtra, India: retrospective six years study. Int J Reprod Contracept Obstet Gynecol,7, 3043-7. http://dx.doi.org/10.18203/2320-1770.ijrcog20182956
- Goyal, M., Singh,P., Singh, K., et al.(2021). The effect of the COVID-19 pandemic on maternal health due to delay in seeking health care: Experience from a tertiary center. Int J Gynaecol Obstet.,Feb;152(2):231-235. doi: 10.1002/ijgo.13457.
- Jithesh, V., Ravindran, T.S.(2016). Social and health system factors contributing to maternal deaths in a less developed district of Kerala, India. J Reprod Health Med.,2(1),26-32. DOI:10.1016/J.JRHM.2015.12.003
- Khandale, S.N., Kedar, K. (2017). Analysis of maternal mortality: a retrospective study
- at tertiary care centre. Int J Reprod Contracept ObstetGynecol,6:1610-3. http://dx.doi.org/10.18203/2320-1770.ijrcog20171437
- Knight, H.E., Self, A., Kennedy, S.H.(2013). Why are women dying when they reach hospital on time? a systematic review of the 'third delay'. PLoS ONE, 8(5),e63 846. https://doi.org/10.1371/journal.pone.0063846
- Mahapatro, M.(2015) Equity in utilization of health care services: Perspective of pregnant women in southern Odisha, India. Indian J Med Res. Aug;142(2):183-9. doi: 10.4103/0971-5916.164251.
- Ministry of Health & Family Welfare, Govt. of India. (2020).Operational Guidelines on Life Saving Anaesthesia Skills(LSAS) and Comprehensive Emergency Obstetric and Newborn Care (CEmONC). https://nhsrcindia.org/sites/default/files/2021-07/Guideline%20CEmONC%20%26%20LSAS.pdf
- Ministry of Finance (2023). Health an integral component of social welfare, leitmotif for the government. https://pib.gov.in/PressReleasePage.aspx?PRID=1894904

- Murthy, B.K., Murthy, M.B., Prabhu, P.M.(2013). Maternal Mortality in a Tertiary Care Hospital: A 10-year Review. Int J Prev Med.,Jan;4(1):105-9.
- Ntambue, A.M., Malonga, F.K., Cowgill, K.D. et al.(2017). Emergency obstetric and neonatal care availability, use, and quality: a cross-sectional study in the city of Lubumbashi, Democratic Republic of the Congo, 2011. BMC Pregnancy Childbirth **17**:40. DOI 10.1186/s12884-017-1224-9
- Sikder, S.S., Labrique, A.B., Craig, I.M. et al.(2015). Patterns and determinants of care seeking for Obstetric complications in rural northwest Bangladesh; analysis from a prospective cohort study. BMC Health Serv Res.,15,166. https://doi.org/10.1186/s12913-015-0832-1

- Thaddeus, S., Maine, D. (1994).Too far to walk: maternal mortality in context. Soc Sci Med., 38: 1091-1110.
- Wellington, A.(2017). Maternal mortality literature review risk management. Technical report. 10.13140/RG.2.2.13930.21449