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Original Research Article

Fetomaternal outcome of referred obstetrics patients in tertiary care centre

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ABSTRACT

Background: Pregnancy is a natural physiological process, with most cases being low-risk and managed safely at primary healthcare centers. However, the timely referral of high-risk pregnancies to specialized care is crucial to prevent complications and reduce maternal and neonatal morbidity and mortality. In India, particularly in rural areas, the referral system's efficiency is vital in improving feto-maternal outcomes. Despite improvements in maternal mortality rates, the referral system faces challenges, such as poor coordination and delayed referrals, undermining further reductions in maternal mortality. This study examined the outcomes of emergency obstetric transfers to a tertiary hospital, focusing on the reasons for these transfers and the impact of specialized care on maternal and neonatal health.

Methods: A retrospective observational study was conducted at GSVM Medical College, Kanpur, over a six-month period from January 1, 2024, to June 31, 2024. Data were collected on maternal and fetal demographic characteristics, clinical and obstetric conditions, and neonatal outcomes from hospital records. The study population included all obstetric cases >28 weeks referred to the department of obstetrics and gynecology.

Results: Out of 2459 deliveries, 718 cases (29.2%) were referred, with the majority (78.6%) in the 21-30 age group. Most referrals were multipara (54.4%) and from district hospitals (43.8%) and CHCs (41.4%). The main reasons for referral were pre-eclampsia (13.6%), previous caesarean sections (11.4%), and anemia (12.4%). Maternal morbidity was observed in 244 cases (34%), with anemia, postpartum hemorrhage, and eclampsia being the most common complications. Maternal mortality occurred in 12 cases, primarily due to hypertensive disorders, coagulopathy, and sepsis. Among 735 births, 81.2% of babies were discharged without complications, 14.5% required NICU admission, and 4.3% were stillborn.

Conclusions: Timely referral and specialized care are critical in managing high-risk pregnancies and improving maternal and neonatal outcomes. Strengthening first referral units (FRUs) and training healthcare workers are essential steps to enhance the referral system and reduce the burden on tertiary care facilities.

Keywords: Antenatal care, Maternal mortality, Neonatal outcome, Obstetric referral system, Tertiary care centre

INTRODUCTION

Pregnancy is a natural physiological process, and the majority of pregnancies are low-risk, allowing them to be managed safely and effectively at primary healthcare centres. Regular antenatal check-ups at these centres are crucial for monitoring the progress of pregnancy, identifying potential high-risk factors, and ensuring that appropriate care is provided at every stage. These routine visits play a vital role in the early detection of complications, which enables timely referrals to more specialized healthcare facilities when necessary. This proactive approach in managing pregnancy can significantly reduce the risk of complications, leading to better outcomes for both mother and baby. Ultimately, such measures contribute to a decrease in feto-maternal

morbidity and mortality rates. In a developing country like India, where a large portion of the population resides in rural areas with limited access to essential obstetric services, an efficient referral system is critical.[1] The referral system acts as a bridge between primary healthcare centres and specialized care facilities, ensuring that pregnant women receive the level of care they need when high-risk factors are identified. Despite a noticeable reduction in maternal mortality rates- from 130 per 100,000 live births in 2014-2016 to 103 in 2017-2019- the current referral system in India still faces significant challenges.[2] These challenges include poor coordination, delayed referrals, and a lack of streamlined processes, which can undermine efforts to further reduce maternal mortality.

The World Health Organization (WHO) underscores the importance of emergency obstetric care (EmOC) services in reducing maternal mortality, particularly in low- and middle-income countries where access to quality healthcare is often limited.[3] The WHO advocates for the referral of high-risk pregnant women to well-equipped healthcare facilities where specialized care can be provided. This ensures timely management of potential complications, improving outcomes for both the mother and the newborn. In India, the introduction of the Janani Suraksha Yojana (JSY) in 2005 has led to a significant increase in institutional deliveries, particularly among women from weaker socioeconomic backgrounds. However, despite this progress, the decline in maternal mortality has not been as substantial as expected. One of the key reasons for this is the inefficiency in the referral system, which often results in poor or delayed referrals of high-risk cases.

To address this, it is recommended that pregnant women with high-risk conditions- such as history of cesarean section, breech presentation, transverse lie, multiple gestations, hypertension, and severe anemia- to be electively referred to healthcare facilities equipped to handle such cases. Early and appropriate referral can prevent complications arising from delayed or inadequate care.

This study examined the outcomes of emergency obstetric transfers to a tertiary hospital, focusing on the reasons for these transfers and the impact that specialized care has on the health of both mother and baby. By analyzing these factors, the study aimed to highlight the critical role of an efficient referral system in improving maternal and neonatal outcomes, particularly in resource-limited settings.

METHODS

Settings

This retrospective observational study was conducted at the department of obstetrics and gynecology and the department of pediatrics at GSVM Medical College, Kanpur, spanning a one-year period from January 1, 2024 to June 31, 2024. The study collected data on maternal and fetal demographic characteristics, as well as the mother's clinical and obstetric conditions, from hospital files in the department of obstetrics and gynecology. Additionally, data regarding neonatal outcomes were obtained from the neonatal intensive care unit (NICU) in the department of pediatrics. This comprehensive data collection aimed to provide a thorough understanding of maternal morbidity and mortality factors and associated neonatal outcome.

Inclusion criteria

Obstetric cases with a gestational age of more than 28 weeks. Referred cases to the department of obstetrics and gynecology, GSVM Medical College, Kanpur. Emergency obstetric transfers to the tertiary care hospital.

Exclusion criteria

Obstetric cases with a gestational age of less than 28 weeks. Non-referred cases managed directly at the tertiary care hospital. Cases with incomplete or missing clinical and obstetric data. Patients admitted for non-obstetric emergencies or unrelated conditions. Elective admissions without referral from another facility.

Data collection

The study data was collected from case sheets of patients referred and managed at our hospital. Detailed clinical history, place of referral, cause of referral was studied. Complete physical and obstetric examination was done and relevant investigations were done. Management of the patient, clinical course, mode of delivery (vaginal or operative or conservative) and maternal outcome was documented. To know perinatal outcome, APGAR score was noted, if needed NICU admission cause for it was noted. Descriptive statistics like percentages were used for analysis.

RESULTS

As shown in Table 1, 718 cases (29.2%) were referred among 2459 cases which were delivered maximum numbers of cases in present study were in the age group of 21-30 years comprising 78.6% of total cases. Majority of the referral cases were multipara- 391 (54.4%). Among referred patients, 534cases (74.4%) underwent cesarean section, 184 cases (25.6%) delivered vaginally. Only 26.6% were accompanied with ASHA workers. Maximum referred cases (88.8%) came with 108 government ambulance. Maximum referral was from district hospital- 314 (43.8%) followed by CHC- 297 (41.4%), from nearby medical colleges- 56 (7.8%), private hospitals- 32 (4.4%) least from PHC- 19 (2.6%) because of hierarchical referral chain. Out of 718 cases, 274 cases came late to our centre because of delay in decision making by patient's attendant (15.6%), delay in transport facility (21.2%).

Table 1: Distribution of maternal characteristics.

Characteristics	Number	Percentage
Age group		
<21 years	92	12.8
21-30 years	564	78.6
>30 years	62	8.6
Parity		
Primipara	327	45.6
Multipara	391	54.4
Mode of delivery		
Vaginal delivery	184	25.6
LSCS	534	74.4
Accompanied with ASHA		
Yes	191	26.6
No	527	73.4
Mode of transport		
Government ambulance	637	88.8
Private mode	81	11.2
Referral centre		
PHC	19	2.6
CHC	297	41.4
District hospitals	314	43.8
Nearby government medical colleges	56	7.8
Private hospitals	32	4.4
Reason for delay		
Delay in decision making of patient's attendant	112	15.6
Delay in transportation	152	21.2
No delay	454	63.2

Table 2: Causes of referral.

Characteristics	Number	Percentage
PROM	40	5.6
Preeclampsia and related conditions	98	13.6
Previous LSCS (one or more)	82	11.4
Post dated	19	2.6
Pre term labor	42	5.8
Anaemia	89	12.4
Non progress of labor	24	3.4
APH	44	6.2
CPD	34	4.8
Twins	17	2.4
Bad obstetrics history	23	3.2
Sero-positive	8	1.1
Obstructed labor	18	2.4
Hand prolapse	6	0.8
Cardiac disease	7	1
MSAF +fetal distress	93	13
FGR	56	7.8
Malpresentation	18	2.5

The Table 2 shows cause of referral, in the present study, majority of referred patients were referred for preeclampsia and related conditions 98(13.6%), previous LSCS (one or more)- 82 (11.4%), anemia 89 (12.4%), meconium-stained liquor- fetal distress- 93 (13%). Other common causes include premature rupture of membranes (PROM), preterm labor, postdated pregnancy, cephalopelvic disproportion (CPD), twins, antepartum haemorrhage, bad obstetric history, obstructed labor, hand prolapse, seropositive cases, fetal growth restriction, malpresentation.

Table 3: Causes of maternal morbidity.

Characteristics	Number (n=244)	Percentage
Anaemia	112	45.9
Eclampsia	21	8.8
Atonic PPH	39	16
Traumatic PPH	37	15
Infection	10	4.2
Coagulopathy	9	3.8
Caesarean hysterectomy	12	4.9
Prolonged catheterization	4	1.4

The Table 3 shows, out of all 718 cases, there were 244 (34%) cases of maternal morbidity. Out of 244 complications, there were 112 (45.9%) cases of anemia,76 cases of postpartum haemorrhage (31%), 21 cases (8.8%) of eclampsia, 10 cases (4.2%) develop severe infections, 9 cases (3.8%) suffered coagulopathy, 4 cases required prolonged catheterization (1.4%), 12 cases underwent caesarean hysterectomy (4.9%). 41 cases among 244 cases need ICU admission and ventilatory support.

Table 4: Causes of maternal mortality in referred obstetric cases.

Characteristics	Number (n=12)
Irreversible hemorrhagic shock + PPH + DIC	2
PPH + MODS	1
Traumatic PPH + shock	2
Hypovolemic shock + eclampsia	2
Haemorrhagic shock + PPH + ATN + ARDS + septic shock	1
Septicaemia + pulmonary edema + DIC	1
Purpureal sepsis + septic shock + AKI+ Acute liver failure +LRTI	1
ARDS + septic shock + pulmonary edema + severe PET + HELLP	2

The Table 4 shows maternal mortality was seen in 12 cases. The most common obstetric cases were eclampsia and HELLP syndrome. Out of twelve cases, two cases were due to irreversible haemorrhagic shock with PPH with DIC, one case was due to PPH with MODS, two cases were due to traumatic PPH with shock, two cases were due

to hypovolemic shock with eclampsia, one case due to hemorrhagic shock with PPH with ATN with ARDS with septic shock, One case due to septicaemia with pulmonary edema with DIC, one case due to puerperal sepsis with septic shock with AKI with Acute liver failure with LRTI, One was case due to ARDS with septic shock with Pulmonary edema with severe PET with HELLP.

Table 5: Fetal outcome.

Outcome	Number (n=735)	Percentage
Mother side	597	81.2
NICU admission	106	14.5
Still birth	32	4.3

The Table 5 shows fetal outcome, there were 17 cases of twins. So total birth count was 735, out of which 597 (81.2%) babies were shifted to mother side without any complication, 106 (14.5%) cases required NICU admission. 32 (4.3%) cases were stillbirth.

DISCUSSION

Obstetric complications can be unpredictable and rapidly become life-threatening if not managed promptly and effectively. A well-functioning referral system is crucial to ensure timely transfer of patients to a higher level of care, especially in obstetric emergencies where every minute counts. The findings of this study provide significant insights into the challenges and outcomes associated with the referral of high-risk obstetric cases to a tertiary care hospital in a resource-limited setting.

In this study, there were 2459 total deliveries, out of which 718 (29.2%) cases were referred, which is comparatively more than studies done by Jakhar and Choudhary (9.96%), Ghardallou et al (15.23%), and Shenoy et al (7.03%).[4-6] This elevated rate suggests that a significant number of cases were either beyond the management capacity of lower-level facilities or that there was a tendency for early referrals, possibly due to inadequate resources or lack of confidence among primary healthcare providers. This underscores the need for better training and resource allocation at the primary and secondary levels of care to reduce unnecessary referrals and ensure that only genuinely high-risk cases are escalated to tertiary care.

Gupta et al found 52.17% patients were primigravida, Goswami et al found 47% patients were primigravida, Banu et al had found that 50% of women were primigravida, which is comparable to the 45.6% primigravida cases found in the present study.[7-9] In our study most cases were referred from district hospital (43.8%) and CHCs (41.4%). Which is similar to studies conducted by Kumari et al, and Prakash et al, where most of the referrals were from CHCs and DHs.[10,11] In our study least number of patients referred from private hospital (4.4%), which is similar to study conducted by Jakher and Choudhary and Roy et al had (0.88%) and (14%) referrals from private hospitals.[12,13] For better patient care, there is a referral linkage system between major hospitals (tertiary care) attached medical colleges and peripheral hospitals (secondary care) and maternity homes (primary care). It helps to reduce the overburden of tertiary hospitals.

In our study 21.5% cases came late to our centre because of some reasons like delay in getting transport facility, 15.6% cases came late because of delay in decision making by patient's relatives, 63.2% cases reached timely without any delay. The percentage of cases with delayed referral were quite high in our study as compare to study of Gupta et al, who had only 5.58% referral.[7] These delays are critical factors contributing to poor outcomes, as timely access to specialized care is often the difference between life and death in obstetric emergencies. The findings suggest that improving the referral system requires not only better infrastructure and transport facilities but also increased awareness and education among patients and their families about the urgency of certain obstetric conditions.

Causes of referral

maximum referral among maternal obstetric indications were pre-eclampsia (13.6%%), previous LSCS (one or more) (11.4%), anemia (12.4%) followed by antepartum haemorrhage (6.2%), among fetal indications, meconium-stained liquor + fetal distress (13%) and fetal growth restriction (7.8%) were the major causes of referral to our hospital. Patel et al in their study found that causes of referral were pre-eclampsia (16%) and meconium-stained liquor (5%).[14] Previous caesarean sections were the cause of referral in 10% of cases in the present study which is similar to the study conducted by Goswami et al (6%), Khatoon et al (15%).[15,16] Other common causes were obstructed labour, mal-presentations, CPD, hand prolapse, twins, postdated, PROM, and preterm labour pain which shows negligence or inability of the health care providers at referring health centres in proper evaluation of patients. Referral to a specialized facility is necessary due to: high-risk pregnancy requiring advanced neonatal care for preterm or growth-restricted infants. Need for expert medical management of complex pregnancy conditions. Inadequate resources at the current facility, including-Blood banking capabilities, emergency surgical services, anaesthesia service, pediatric specialist support.

Management of complications

In this study, there were 244 (34%) cases of maternal morbidity. Out of 244 complications, 76 (31.14%) patients required blood transfusion. There were 112 (45.9%) cases of anemia, 21 (8.8%) cases of eclampsia, and 76 (31%) cases of postpartum haemorrhage including both atonic and traumatic postpartum hemorrhage. Forty-one cases among 244 required ICU admissions and ventilatory support. 10 (4.2%) cases had wound infections and 9 (3.8%) had disseminated intravascular coagulation. In 12 cases, obstetric hysterectomy was done for atonic postpartum hemorrhage, and in 37 cases, vaginal

exploration was required for traumatic postpartum haemorrhage. 4 cases (1.4%) required prolonged catheterization. Referred patients had higher complications due to late labor admission, pre-existing conditions, and inadequate care from untrained personnel. These issues could have been prevented with proper antenatal care, trained rural healthcare professionals, and timely referrals for specialized care.

Maternal mortality

In this study, maternal mortality was seen in 12 cases. 2 cases were due to irreversible hemorrhagic shock + PPH + DIC. 1 case due to PPH + MODS. 2 cases due to traumatic PPH + SHOCK. 2 cases due to hypovolemic shock + eclampsia, 1 case due to hemorrhagic shock + PPH + acute tubular necrosis. 1 case due to septicaemia + pulmonary edema + DIC. 1 case due to puerperal sepsis + septic shock + acute kidney injury + acute liver failure + LRTI. 2 cases due to ARDS + septic shock+ pulmonary edema + severe PET + HELLP. Majority of cases were due to anemia, hypertensive disorder of pregnancy, coagulopathy and sepsis. These outcomes highlight the critical importance of timely and appropriate management of high-risk pregnancies. Late referrals, often due to delays in decision-making or transport, contributed significantly to adverse outcomes. Jakhar and Choudhary reported nine mortalities, and Gupta et al reported 40 (2.72%) mortalities; common causes were hypertensive disorder (35%), severe anemia (20%), hemorrhage (20%), sepsis (10%).[6,7] According to Narsaria et al patients came with eclampsia that is a major preventable cause of maternal mortality, reinforcing the need for early intervention and better management at referring facilities.[16]

Fetal outcome

Total birth count was 735, out of which 597 (81.2%) babies were shifted to mother side without any complication, 106 (14.5%) cases required NICU admission. 32 (4.3%) cases were stillbirth. Akaba and Ekele reported (16.4%) stillbirth which was very high in comparison to our study.[17] In study by Latika et al 15.74% of neonates were admitted to NICU.[18] The high rate of stillbirths and NICU admissions reflects the challenges of managing high-risk pregnancies and the need for improved fetal monitoring and care during the referral process. It also points to the necessity for better neonatal care facilities at referring centers to stabilize newborns before transfer.

CONCLUSION

The study highlights the crucial role of an efficient referral system in managing high-risk pregnancies, which is vital for reducing maternal and neonatal morbidity and mortality. The findings indicate that a substantial number of complications and adverse outcomes could have been mitigated through timely referrals, better antenatal care, and prompt interventions at appropriate healthcare facilities.

A well-functioning referral system ensures that high-risk obstetric cases are identified early and transferred to specialized care centers where advanced medical support is available. This is particularly important in rural areas and resource-limited settings, where primary healthcare facilities may lack the necessary resources and expertise to manage complex cases. The study revealed that delays in referral- often due to inadequate decision-making, poor transport availability, or lack of awareness- contributed to higher rates of maternal and neonatal complications.

To address these challenges, it is essential to strengthen first referral units (FRUs), which serve as a critical link between primary healthcare centers and tertiary hospitals. Enhancing FRUs involves ensuring the availability of 24/7 emergency obstetric services, including operation theatres, anaesthetists, pediatricians, and blood bank facilities. Additionally, training healthcare workers at the primary and secondary levels in essential antenatal care and emergency obstetric management is necessary. This training should focus on the early detection and management of conditions such as anemia, hypertensive disorders, and other high-risk factors, which are major contributors to maternal and neonatal mortality.

By improving the efficiency and effectiveness of the referral system and enhancing maternal and child health services, we can significantly reduce the burden on tertiary care facilities. This will not only improve maternal and neonatal outcomes but also contribute to a broader reduction in feto-maternal morbidity and mortality rates. The findings of this study underscore the need for coordinated efforts to ensure that every pregnant woman has access to the appropriate level of care at the right time, ultimately leading to healthier outcomes for both mothers and their babies.

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REFERENCES

1. Majella MG, Sarveswaran G, Krishnamoorthy Y, Sivaranjini K, Arikrishnan K, Kumar SG. A longitudinal study on high risk pregnancy and its outcome among antenatal women attending rural primary health centre in Puducherry, South India. J Educ Health Promot. 2019;8(1):12.
2. Significant Decline in the Maternal Mortality Ratio (MMR) from 130 in 2014-16 to 97 per lakh live births in 2018-20: Dr. Mansukh Mandaviya. Ministry of Health and Family welfare. Available from: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1879912. Accessed on 1 June 2024.

3. Goswami P, Bindal J, Chug N. To study pattern of obstetric cases referred at tertiary care centre in central India. Int J Reprod Contracept Obstet Gynecol. 2017;6(6):2370-4.
4. Chaturvedi S, Randive B, Diwan V, De Costa A. Quality of obstetric referral services in India's JSY cash transfer programme for institutional births: a study from Madhya Pradesh province. PloS One. 2014;9(5):e96773.
5. Prathiba P, Niranjjan R, Maurya DK, Lakshminarayanan S. Referral chain of patients with obstetric emergency from primary care to tertiary care: A gap analysis. J Fam Med Prim Care. 2020;9(1):347-53.
6. Jakhar R, Choudhary A. Study of maternal outcome in referral obstetric cases in a tertiary care centre. J Fam Med Prim Care. 2019;8(9):2814.
7. Gupta PR, Chaudhari SN, Gonnade NV. Maternal and fetal outcome in referred patients to tertiary care centre. Sch J App Med Sci. 2016;4(5C):1624-34.
8. Banu M, Nahar S, Nasreen H. Assessing the MANOSHI referral system-addressing delays in seeking emergency obstetric care in Dhaka's slums. Manoshi-WP102010. 2010;1:36.
9. Banu M, Nahar S, Nasreen H. Assessing the MANOSHI referral system-addressing delays in seeking emergency obstetric care in Dhaka's slums. Manoshi-WP102010. 2010;1:36.
10. Kumari A, Mitra S, Aditya V. Spectrum of obstetric referral and their outcome at a tertiary care center of Eastern Uttar Pradesh: An insight. Asian J Med Sci. 2022;13(4):123-8.
11. Prakash G, Meena P, Meena S, Bariya S. Study of feto-maternal outcome in referred obstetric cases in tertiary care center in Rajasthan: a cross-sectional study. Int J Reprod Contracept Obstet Gynecol. 2022;11(7):1952.
12. Patel HC, Singh BB, Moitra M, Kantharia SL. Obstetric referrals: scenario at a primaryhealth centre in Gujarat. Nat J Community Med. 2012;3(4):711-4.
13. Dutta I, Roy P, Dasgupta S, Khan M, Saha P. Obstetrics referrals: maternal and perinatal outcome in medical college hospital in eastern India. Indian J Obstet Gynecol Res. 2020;7(1):91.
14. Patel HC, Singh BB, Moitra M, Kantharia SL. Obstetric referrals: scenario at a primaryhealth centre in Gujarat. Nat J Community Med. 2012;3(4):711-4.
15. Khatoon A, Hasny SF, Irshad S, Ansari J. An audit of obstetric referrals to Abbasi Shaheed Hospital. Pak J Surg. 2011;27(4):304-8.
16. Narsaria K, Mukhopadhya P, Kyal A, Agarwal K, Agarwal A, Sanghi S. A study of obstetric referrals-one year experience at a tertiary care centre in West Bengal. hospital. 2017;34:34.
17. Akaba GO, Ekele BA. Maternal and fetal outcomes of emergency obstetric referrals to a Nigerian teaching hospital. Trop Doct. 2018;48(2):132-5.
18. Nanda LS, Sirohiwal D, Singhal RS, Chauhan M, Sarika A. To study the pattern of maternal and perinatal outcome of referred obstetrics cases in a tertiary care hospital of Northern India. Int J Clin Obstet Gynecol. 2020;4(5):216-9.

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