

Spectrum of obstetric referral and their outcome at a Tertiary Care Center of Eastern Uttar Pradesh: An insight



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ABSTRACT

Background: Pregnancy and childbirth, especially in high-risk women, necessitate proper antenatal, intranatal, and immediate postpartum care. Early detection of complications and prompt referral to the higher level of care can reduce the associated adverse maternal outcomes. **Aims and Objectives:** The aim of the study was to evaluate the spectrum of pregnancy-related referrals to our hospitals and their outcomes. **Materials and Methods:** A prospective observational study was conducted in the Department of Obstetrics and Gynecology, B.R.D Medical College, Gorakhpur, U.P, India, over a period of 1 year (October 2020–September 2021). All the referred cases of obstetric indications ≥ 28 weeks of gestation were analyzed for reasons of referral and their outcomes. **Results:** Obstetrics referral accounted for 31.15% of the total obstetrics admissions (1416/4545). The average age of study participants was 26.92 years and majority being primigravida. The major reasons for referring patient were hypertensive disorders of pregnancy (16.74%), previous cesarean section (12.78%), and severe anemia (7.70%). There were 70 maternal deaths leading to case fatality rate of 4.94% while 94.2% of patient were discharged healthy. **Conclusion:** Lack of knowledge, ignorance, and poor transport facilities are major contributors of poor pregnancy outcome. Timely and appropriate referral is crucial in improving maternal outcome. Improvement in the quality of Maternal Child Health care at Primary Health Centre, Community Health Centre level; regular training of health-care providers in emergency obstetrics care is required to curb unnecessary referrals and consequently in reducing fetomaternal morbidity and mortality.

Key words: Antenatal care; Maternal outcome; Morbidity; Mortality

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INTRODUCTION

Although motherhood is a boon of nature, delivery is the most crucial event in a women's life where a mother is born along with her baby. Prevention of maternal mortality is one of our prime goals to provide safety to motherhood and to avoid loss to the family, society, and the nation.

The World Health Organization reports that about 800 women die from pregnancy and birth related complications around the world every day.¹ Approximately one-quarter of all pregnancy- and delivery-related maternal deaths worldwide occurs in India, which has the highest burden

of maternal mortality for any single country.^{2,3} India has come a long way in improving maternal health as evident from significant decline in maternal mortality ratio (MMR) from 130 in 2014–2016 to 113 in 2016–2018.⁴ This has been possible after implementation of various health programs such as Janani Suraksha Yojana, ambulance services, and Janani Shishu Suraksha Karayakram. However, MMR of Uttar Pradesh is still very high as compared to national average (197 vs. 113).⁴ One of the possible reasons could be poor functioning of referral system in the state. Referral system is an essential component of any health-care systems. The World Health Organization estimates that at least 88–98% of maternal deaths can be averted with

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timely access to emergency obstetrics care services using efficient referral system.⁵

There is existing a three-tier referral system to improve the service delivery from grass root level to the apex of the health-care system and thereby allowing maximum utilization of health-care facilities, but the actual practice of referral is entirely different than the actual laid down principle. Unnecessary referrals pose a burden on tertiary care hospital.

Since, Uttar Pradesh is a low performing Indian State with regard to health indicators, with a MMR of 197 per 100,000 live births,⁴ limited studies have been conducted to analyze the determinants of pregnancy-related referrals.

Aims and objectives

The aim of the study was to evaluate the maternal determinants of obstetrics referrals, referrals characteristics (source of referral, distance travelled to receive comprehensive emergency obstetrics care and mode of transport, and referral arrival interval), mode of delivery, and maternal outcome.

MATERIALS AND METHODS

This was a single-center, prospective, and observational study conducted in the Department of Obstetrics and Gynecology, B.R.D Medical College, Gorakhpur, U.P., India, from October 1, 2020, to September 30, 2021.

Patient inclusion criteria

We enrolled all the obstetrics referrals to our tertiary care center ≥ 28 weeks of gestation.

Exclusion criteria

Referred cases of < 28 weeks gestation, booked patients, and gynecologic referrals were excluded from the study.

The detailed history regarding socio-demographic profile, obstetrics history, antenatal checkups, details of referring hospital, mode of transportation, indication of referral, adequacy of the referred slip, condition of patient on admission, and reasons for delay were noted. Complete physical and obstetrical examination was performed.

Basic investigations such as complete blood counts, ABO/Rh, obstetrical ultrasound, and case specific investigations were carried out as mandated by clinical condition of the patient. Management of patient was recorded, whether conservative or interventional. Mode of delivery and maternal outcome in the form of maternal morbidity or mortality was noted. All mothers were followed till discharge from the hospital. Written informed

consent was sought from all study participants. The study was approved by the Institutional Ethical Committee (dated August 26, 2021). Data were analyzed using Microsoft office Excel 2013. The results were computed in the form of percentage.

RESULTS

During the study period of 1 year, total 4545 obstetric patients were admitted. Out of them, 1416 (31.15%) women with pregnancy-related complications were referred to our tertiary care center from surrounding health facilities (Fig 1). The majority of patients (83.05%) were in the age group of 21–30 years and most of them were primigravida (58.05%). This is because early marriages occur in our country. The majority of study population (70.90%) resided in rural areas. The most of the patients were poorly educated (illiterate – 46.19%) or primary education (34.46%). About 67.37% of the referred cases have gestational age more than 36 weeks (Table 1).

The majority of cases were referred from district hospital, that is, 468 (33.05%) followed by private hospital/clinics and Community Health Centre (CHCs) (25.56%). Least cases were referred from Primary Health Centre (PHCs) (13.21%) (Table 2). The most of the patients used government ambulance (108 ambulance) for transportation to reach health facility. Delay in seeking care either in decision-making (23.23%) or in transportation (20.06%) was the important reasons for delay in reaching tertiary center (Table 3).

Hypertensive disorders of pregnancy (16.74%) were found to be the most common cause of obstetric referral. The previous cesarean sections, anemia, and postpartum hemorrhage accounted to 12.78%, 7.70%, and 6.07%

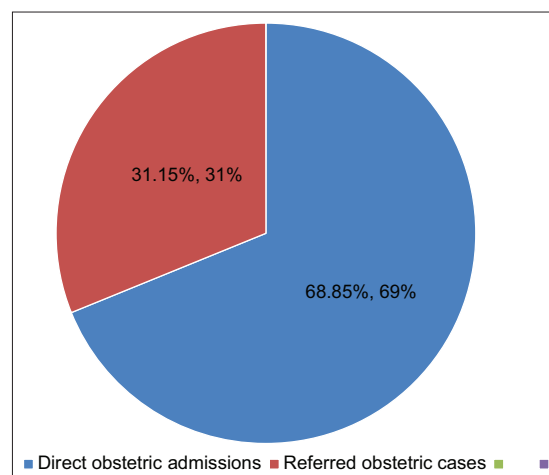


Figure 1: Distribution of referred patients

referral to tertiary care center, respectively (Table 4). The most of the patient delivered vaginally (56.36%) while 37.44% patient underwent cesarean section. Conservative management was done in 5.51% cases (Figure 2).

The majority of patients (94.2%) included in the study were discharged (Table 5). There were 70(4.94%) maternal

Parameters	Number (n)	Percentage
Age (years)		
<20	38	2.6
21–30	1175	83.05
31–40	170	12.0
>40	33	2.3
Parity		
Primigravida	822	58.05
Multi	594	41.95
Socioeconomic status		
High	72	5.08
Middle	458	32.34
Low	884	62.43
Domicile		
Rural	1004	70.90
Urban	412	29.09
Education		
Illiterate	654	46.19
Primary school	488	34.46
Secondary school	168	11.86
Higher secondary	82	5.79
College and above	24	1.69
Gestational age (weeks)		
28–32	122	8.62
32–36	340	24.01
>36	954	67.37

Causes	Number (n)	Percentage
Hypertensive disorders of pregnancy	237	16.74
Previous cesarean section (previous 1/2/3)	181	12.78
Antepartum hemorrhage	79	5.58
Obstructed labor	39	2.75
Anemia (severe)	109	7.70
NPOL	64	4.52
Malpresentation	50	3.53
PROM	68	4.80
Pre-term (NICU not available)	68	4.80
Oligohydramnios/IUGR	69	4.87
IUD	26	1.83
CPD/contracted pelvis	57	4.02
Post-term	34	2.40
Fetal distress	62	4.38
Congenital malformation	12	0.84
Twin/triplet	49	3.46
Rupture uterus	9	0.64
PPH	86	6.07
Heart disease	13	0.91
HBsAg/HIV	26	1.83
Thrombocytopenia	20	1.41
Others	57	4.02
Total	1416	100

mortalities and 12 patients were transferred from our department to other specialties for further management of respective complications.

Hypertensive disorders of pregnancy (44.28%) were found to be the most common cause of maternal mortality. Anemia was next important cause of maternal deaths. Sepsis and postpartum hemorrhage were responsible for 14.29% and 5.7% maternal deaths, respectively (Table 6).

DISCUSSION

Obstetric complications are unpredictable and may prove fatal if appropriate treatment is not provided within a short window of time. An effective and efficient referred system is important to facilitate efficient transfer of patients to next level of care, particularly in case of obstetrics emergencies. Despite the importance of an effective referral system, limited studies have analyzed the functioning and quality of referral system in India, especially in Uttar Pradesh. Hence, this study was planned.

Referral rate and maternal demographics

Referral rate was 31.15% in the present study, which was higher than other studies. Puri et al.⁶ noted 24.16% of obstetrical referral. Similarly, study by Agarwal et al.,⁷ Sabale and Patankar,⁸ and Patel et al.⁹ reported referral rate of 20.86%, 17.83%, and 15.2%, respectively.

Place of referral	Number (n)	Percent
Institution from where referred		
PHC	187	13.21
CHC	362	25.56
DH	468	33.05
Private hospital and clinic	399	28.18
Distance from referral center		
<10 km	148	10.45
10–50 km	846	59.75
50–100 km	382	26.98
>100 km	40	2.8
Mode of transport		
Government ambulance	1002	70.76
Private ambulance	130	9.18
Private vehicle	196	13.84
Others	88	6.21

Reasons	Number (n)	Percent
Delay in decision-making	326	23.22
Delay in transportation	284	20.06
Arrangement of money	134	9.46
No delay	672	47.46
Total	1416	100

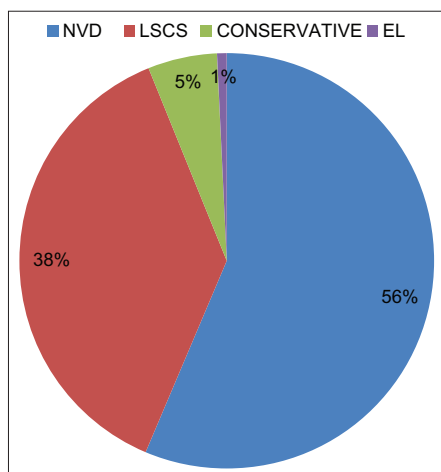


Figure 2: Mode of delivery

Maternal outcome	Number (n)	Percent
Discharged	1334	94.2
Referred to higher center	12	0.85
Expired	70	4.94
Total	1416	100

Causes	Number (n)	Percent
Hypertensive diseases of pregnancy	33	47.14
Obstructed Labor	1	1.43
Postpartum Hemorrhage	10	14.29
Anemia (severe)	13	18.57
Antepartum hemorrhage	1	1.43
Rupture uterus	1	1.43
Post-operative complications	1	1.43
Pulmonary embolism	2	2.86
CVA	1	1.43
Medical conditions	2	2.86
Others	5	7.14

Maternal age

In the present study, the most of the respondents (83.05%) were in the age group of 21–30 years. This age is usually considered as low-risk group. However, this study showed that the majority of patients requiring referral belonged to this age group. Hence, the “high-risk” approach for better utilization of the scarce resources is irrational and pregnancies in this particular age group are equally vulnerable to complicate if not monitored properly and also these complications cannot be predicted with reasonable accuracy. Our findings were consistent to the findings of Gupta et al.,¹⁰ where 86.98% of patients were in this age group. Devineni and Sodumu¹¹ and Patel et al.⁹ showed that 73% and 64% of obstetrics referrals were in the age group of 21–30 years. The possible reasons could be the culture of early marriages in rural Uttar Pradesh.

Parity

The majority of patients referred were primigravida (58.05%) which is comparable to other studies^{7,12} whereas 41.95% were distributed between gravida 2 and 6. The number of referral reduced with increasing age and gravidity.

Educational status and socioeconomic status

Education is the key for the successful implementation of health programs. In the present series, maximum number of referred patient was either uneducated (46.19%) or poorly educated (34.46%), that is, up to the primary school. This is comparable to the study performed by Devineni and Sodumu¹¹ who showed that 40% of referred cases were illiterate. Similar results were shown by Thaker et al.¹³ who reported that 34.7% of referred cases were illiterate. The majority of patients (62.43%) belonged to low socioeconomic class. The educational and socioeconomic status of a woman plays a significant role in utilization of maternal health services. This is in accordance to the findings of Limaye et al.¹⁴

Domicile

Approximately three-quarter (70.90%) of referred patient belonged to rural areas. This is possibly because the majority of population of Eastern Uttar Pradesh resides in rural areas. This high proportion of ignorant rural population could be a reason for delayed access to health-care services. This was consistent to the studies performed by Vinayak et al.¹⁵ and Wahane and Koranna¹⁶ who reported a rural domicile of 77%.

Referring centers

The most of the cases were referred from district hospitals (33.05%) followed by private hospitals (28.18%) and CHCs (25.56%). Least number of cases (13.21%) referred from PHCs. A study performed by Sable and Panchal⁸ showed that 15.79% were referred from PHCs, 42.37% from district hospitals, 34.74% from referred hospitals, and 2.63% from ESI hospitals.

In this series, the main reason for referral includes non-availability of obstetrician, anesthetists, pediatrician, trained staff, inadequate infrastructure to perform cesarean section, logistic constraints, lack of blood bank services, and non-availability of NICU. Other studies also reported the same.^{17,18} This inadvertently increases the number of referral and burden on tertiary centers consequently lowering the quality of health Services. Hence, provision of adequate infrastructure, manpower, and strengthening of existing first referral units could provide prompt treatment then and there and ultimately save life.

Reason for delayed referral

In the present study, 52.54% patient reached late to our center due to reasons such as delay in seeking care (delayed

decision-making 23.22%) and delay in reaching appropriate health facility (delay in transportation 20.06% and delay in mobilizing funds 9.46%). Approximately 70.76% of the patients in this study used 108 ambulances as the mode of transportation to reach tertiary care center. This is because of the effective implementation and availability of emergency ambulance service 108 throughout the Uttar Pradesh state. The percentage of delayed referral cases were quite high in this study as compared to the study performed by Gupta et al.¹⁰ who reported that 76% of the cases reached within 8 h of referral and only 5.58% were delayed referrals (>12 h). The reference and arrival interval do not depend merely on distance between two health-care centers and availability of transport system rather on patient's and her attendant's perspective of education, awareness, and socioeconomic status also plays an important role in determining maternal outcome.

Causes necessitating obstetric referral

In this study, the major reason for transferring patient was hypertensive disorders of pregnancy (16.7%) and previous cesarean section (12.78%). Hypertensive disorders were also found to be major contributor of referral in other studies.¹⁹⁻²² Referring the patient with the previous cesarean section was primarily due to an understanding that a third to half of cesarean are performed because of the history of prior cesarean delivery.^{23,24} The previous two or three cesarean section surgeries are risky be performed at primary or most secondary care facilities due to lack of skilled staff, equipment, and blood bank facilities. Our findings were contrary to the findings of Patel et al.²⁵ who documented that the most of the referral were due to obstructed or prolonged labor. Severe anemia accounted for or 7.70% of referral followed by postpartum hemorrhage 6.07%.

Mode of delivery

The majority of participants in this study delivered vaginally (56.36%) whereas 37.44% underwent cesarean section. In medical colleges and teaching hospitals in India, the overall cesarean delivery rate is 24.4%²⁶ while rates of cesarean section in public, charitable, and private sector hospitals are 20%, 38%, and 47%, respectively,²⁷ showing a progressive rise in cesarean delivery in different health-care facilities.

Maternal outcomes

The present study showed that 94.2% of the referred patients were discharged in satisfactory condition. There were 73 maternal deaths in our hospital during the study period out of which 70 (95.89%) were referred patients. Hypertensive disorders (44.28%) were the most common cause of maternal mortality followed by anemia (15.7%), sepsis (14.29%), and postpartum hemorrhage (5.71%). Hypertensive disorders of pregnancy were reported to be the most common cause of maternal mortality in other studies also.^{10,28}

Limitations of the study

This study provides information on the referral of obstetric emergencies to a tertiary health facility of Uttar Pradesh, India. It leads to an understanding of the inherent challenges in the system using multiple stakeholder perspective and other challenges which are encountered in receiving care at tertiary care hospital. This study was focused on the receiver end of the referral system only and to have a comprehensive view of challenges of the entire system; it will be prudent to involve sending facilities also.

CONCLUSION

Most deaths could be prevented with the help of early identification of high-risk pregnancies, timely referral, quick and efficient transport facilities, availability of blood and maternal education, proper implementation of government policies with community participation, and strengthening of referring centers can help to reduce maternal mortality and thus promoting overall safe motherhood.

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RECOMMENDATIONS

Strengthening of referring centers should be emphasized to improve the quality of Maternal Child Health services and resulting in saving the life of mother and newborns.

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Authors Contribution:

AK- Concept and design of the study and prepared first draft of manuscript, **SM-** Reviewed the literature and manuscript preparation, and **VA-** Statistically analyzed and interpreted the result and revision of the manuscript.

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