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To study the pattern of maternal and perinatal outcome of referred obstetrics cases in a tertiary care hospital of Northern India

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Abstract
Introduction: Obstetric patients constitute bulk of referred cases in a tertiary care hospital with wide ranging indications. Pregnancy and childbirth particularly in high risk patients needs proper antenatal care and timely referral to decrease maternal and neonatal morbidity and mortality.
Aim and objectives
1. To study the pattern of obstetrical referral to our hospital along with their clinical course and maternal and perinatal outcome.
2. To study the different variables related to obstetrical referral and to suggest measures for dropping preventable obstetrical referrals.

Material and methods: It was a prospective observational study conducted at a tertiary hospital. All pregnant patients referred to casualty during the study period were enquired about their detailed history, examination was done and their data was compiled and analyzed.
Results: Total admissions during the study period were 2304. Out of this, total referred cases were 556, and among these were 507 antenatal patients. It was observed that there were 260 vaginal deliveries and 102 patients had LSCS. There were 5 maternal deaths. Out of total births, there were 57 NICU admissions.
Discussion: Most pregnant patients have an antenatal period which is free of complications and comorbidities but a certain chunk of patients are there who are at high risk and need special care and management at a well-equipped center.
Conclusion: Proper training of health personnel at peripheral centers and timely identification and referral of high risk patients reduces maternal and perinatal morbidity and mortality.

Keywords: Referred, high risk, maternal, perinatal, morbidity, mortality, Maternal Mortality Ratio (MMR)

Introduction
The referral services are the backbone of any healthcare delivery system. Antenatal care comprises identification of high risk patients, counseling them and their timely referral to tertiary care centers, so that feto-maternal morbidity and mortality can be reduced. The National Health Policy of India has envisaged a target for MMR of 100 per lakh live births by 2020. According to a study, 92% of maternal deaths are an outcome of delay in referral and leading to delay in case management[1]. Obstetric patients constitute the bulk of referred cases in any tertiary care hospital. In developing nations like India where the majority of people reside in rural areas and lack vital obstetric care, it's very important that such patients should be identified and timely referred to the advanced centers, so that early treatment leads to improved maternal and fetal outcome. On literature review, very few studies are available on this topic. Ours is one of the apex tertiary care hospitals of Northern India and many referred obstetrics emergencies are received by the department of Obstetrics & Gynecology on a daily basis from different rural and urban centers. Therefore, this study was planned to study the pattern of maternal and perinatal mortality and morbidity of these referred cases along with variables like socio demographic profile of these patients, indication of referral, type of referring hospital, delay in referral and treatment etc., so as to implement measures to reduce unnecessary referrals and to reduce maternal mortality and morbidity.

Aim and Objectives
1. To study the pattern of obstetrical referral to our hospital along with their clinical course and maternal and perinatal outcome.

2. To study the different variables related to obstetrical referral and to suggest measures for dropping preventable obstetrical referrals.

Methodology

This was a prospective observational study carried out at the department of Obstetrics and Gynecology of a tertiary care referral institute of Haryana. All obstetrical referral cases received in our hospital during the study period were included in the study. A performa was designed to cover all facets of referral like socio-demographic profile of the patients, detail of referring hospital, mode of transportation, time duration between the referral, indication of referral etc. General as well as obstetrical examination was performed. Basic investigations as well as important investigations pertaining to each case were carried out. The details related to type of management, mode of delivery and maternal and perinatal outcome were documented. All term / near term referred patients admitted in Obstetrical emergency were included in the study and were followed from their admission to delivery and discharge from the hospital. Similarly, the neonates were also studied till discharge from the hospital. No subsequent follow up of these patients was included in the study. Similarly, the patients who were not term/ near term i.e. early pregnancy referral cases, booked patients, self-referral cases, Patients with Gynecological problems and postpartum patients were also not included. The data was collected from the patient referral documents, hospital treatment file and by interviewing the patient or their relatives. This was an observational study and the confidentiality of patient data was absolutely maintained. The ethical issues in the study have been paid due attention and the study had not delayed or deprived any patient from treatment. The data was collected and entered into excel sheets. The master data sheet was prepared and various subgroup analyses were made for arriving at results.

Observation and Results

It was revealed that a total 2304 patients were admitted as obstetrical emergencies during the study period. Out of them, 556 (24.13%) were the referred emergencies and among these referred cases, 507 were antenatal patients. These 507 referred antenatal obstetrical emergencies were observed prospectively during the study period. On age group wise analysis, it was found that the majority of them (62.5%) were in the age group of 20-30 years followed by 30.7% of patients who were in the 30-40 years age group. It was observed that the majority of patients (65%) were from the rural background [Table1].

Table 1: Socio demographic profile of referred patients

Parameters	Total No.	Percentage (%)
Age (In Years)		
<20	10	1.97
20-30	317	62.52
30-40	156	30.77
>40	24	4.73
Place of Residence		
Rural	328	64.69
Urban	179	35.31

In our study, it was found that the majority of the patients were multigravida (56.2%) followed by primigravida (40.6%).

It was also found that most of the patients (65.8%) had periods of gestation as greater than 36 weeks at the time of referral while 21.3% patients had 32-36 weeks of gestation period [Table 2].

Table 2: Distribution of patients according to their parity and Gestational Age at the time of referral

Parameters	Total No.	Percentage (%)
Parity		
Primi Gravida (G1)	206	40.63
Multi Gravida	285	56.21
Gravida-5 (G5) or More	16	3.156
Gestational Age (In Weeks)		
<28	30	5.92
28-32	35	6.90
32-36	108	21.30
>36	334	65.88

On analysis of referral patterns, it was found that the majority of the patients (57.59%) were referred from various District Hospitals followed by Primary Health Centers (18.7%).

It was observed that 58.7% of patients were referred from places which were 10-50 km away from our hospital, followed by 24.45% of patients who were referred from 50-100 km distance. It was also found that the majority of patients (60%) were transported in Hospital ambulances followed by private vehicles (30%) [Table 3].

Table 3: Distribution of patients according to place of referral, mode of transport and distance from referral center

Parameters	Total No.	Percentage (%)
Place of Referral		
Primary Health Centre (PHC)	95	18.74
Community Health Centre (CHC)	84	16.57
District Hospital (DH)	292	57.59
Private Hospital	30	5.92
Medical college	6	1.18
Distance from Referral Centre		
<10km	69	13.60947
10-50km	298	58.77712
50-100Km	124	24.45759
>100Km	16	3.155819
Mode of Transport		
Hospital Ambulance	304	59.96
Private Vehicle	150	29.59
Govt Transport	51	10.06
Others	2	0.39

The different indications of referring to these patients were studied and it was found that the majority of patients (16%) were referred due to anemia of varying degrees followed by preeclampsia (10%) and LSCS (9%) [Table 4].

Table 4: Distribution of patients according to indication of referral:

Indication	Total No	Percentage (%)
Severe Anemia	80	15.78
Preeclampsia	50	9.86
Previous LSCS	45	8.88
Severe Oligohydramnios	22	4.34
Previous 2 LSCS	7	1.38
Jaundice	3	0.59
Meconium Stained Liquor	26	5.13
Pre-Term Labor Pain and non-availability of NICU	41	8.09
Prolonged Leaking Per Vaginum	31	6.11
Cephalo Pelvic Disproportion	6	1.18
Breech Presentation	39	7.69
Ante Partum Eclampsia	11	2.17
Non progress of labor	4	0.79
Ante partum Hemorrhage	18	3.55
Post Maturity	11	2.17
Twin Pregnancy	11	2.17
Fetal Distress	13	2.56
Hypotension	1	0.20
Contracted Pelvis	5	0.99
Pre term Pre mature rupture of membranes	3	0.59
Obstructed Labor	3	0.59
Others	77	15.19

It was found that most of the patients (67.8%) reached the referral center within 6 hours of referral while it took almost 6-12 hours for 24.45% of patients. Rest of them took more than 12 hours to reach their destination. The delay was defined as time taken by the patient to reach the referral center of more than 6 hours. It was observed that in 34 patients delay occurred and in the majority of them, the commonest reason for delay (in 18 patients) was their referral to an intermediate center followed by a poor transport facility (7 patients), ignoring the warning signs (6 patients) [Table 5].

Table 5: Detail regarding time interval between referral and starting of treatment and reason for delay in referral:

Parameters	Total No.	Percentage (%)
Time interval between referral and starting of treatment (In Hours)		
Less than 1Hr	124	24.46
1-6Hr	344	67.85
6-12Hr	32	6.31
12-24Hr	7	1.38
More Than 24Hr	-	-
Reason for Delay (More than 6 hours)		
Referral to Intermediate center	18	52.94
Financial Constraints	3	8.82
Ignoring the warning signs	6	17.65
Poor Transport Facility	7	20.59

On management and outcome analysis of these patients, it was found that out of a total 507 patients, Majority (49.9%) had normal vaginal delivery while130 cases (25.64%) were managed conservatively. In 102 patients, Caesarean section was undertaken due to various indications. Among patients who underwent caesarean section, one patient had caesarean hysterectomy after C.S due to uncontrolled PPH and grave general condition and failure of other measures to control PPH. Same patient was shifted to ICU post-surgery and expired there later on. Seven (07) patients had assisted vaginal delivery. Rest of the patients underwent other procedures like Suction & evacuation, aborts expulsion etc. Out of 507 patients, five (05) patients expired due to various reasons such as very severe anemia with Congestive Cardiac Failure, Eclampsia with shock, Postpartum Hemorrhage etc. It was observed that Majority (80.9%) of the neonates were shifted to the mother side whereas 15.74% of neonates were admitted to the NICU. There were in total ten (10) Intrauterine Deaths and two (02) cases of resuscitation failures [Table 6].

Table 6: Detail related to management and outcome of referred patients

Parameters	Total No	Percentage (%)
Management Detail		
Conservative Management	130	25.64
Normal Delivery	253	49.90
Assisted Delivery	7	1.38
Caesarian Section/ +- Hysterectomy	102	20.12
Others (Missed abortion, Incomplete abortion etc.)	15	2.96
Maternal Outcome		
Alive	502	99.01
Dead	5	0.99
Neonatal Outcome		
Mother side	293	80.94
NICU Admission	57	15.75
Still Birth/IUD /RF	12	3.31

Discussion

Most pregnant patients have an antenatal period which is free of complications and comorbidities but a certain chunk of patients are there who are at high risk and need special care and management at a well-equipped hospital. High risk Obstetrics therefore has emerged as a different super specialty to manage such patients. Ours is a tertiary care hospital where complicated obstetrics and gynecology patients are referred. According to WHO estimates, it was found that at least 88-98% of maternal deaths can be prevented by timely access to essential and emergency obstetric services by efficient referral systems[2]. The proportion of referred cases at our hospital during study period was found to be 24.13% which is in correlation with study of Puri Alka *et al.* [3] where proportion of referred cases was 24.16%. In our study, Majority of patients (62.5%) belonged to the age group of 20-30 years, followed by 30.7% of patients who were in the 30-40 year age group. Similar results were seen in study by Morsheda *et al.* where the majority of patients (74%) were in the age group of 20-35 years [4]. It is also in correlation

with a study done in Africa where the mean age of referred cases was found to be 24.1years [5]. Also, in our current study, the majority of patients (64.69%) were from rural backgrounds and this finding is in agreement with findings of a study undertaken by Wahane *et al*. [6] where 95.65% women belonged to rural areas & only 4.34% were from urban areas. In this study, it was found that majority of patients (56.2%) were multigravida followed by primigravida (40.6%), this finding of our study is in contrary with the finding of study conducted by GuptaPR *et al*. [7] where it was found that 52.17%patients were primigravida. In our study, most of the patients (65.8%) had periods of gestation greater than 36 weeks at the time of referral while 21.3% patients had 32-36 week of gestation. Majority of the patients (57.59%) were referred from District Hospitals. This finding is in agreement with the finding of study carried out by Sabale U *et al*. [8] where the majority of patients (42.37%) were referred from District hospitals. It was observed in our study that Majority of patients (58.7%) were referred from places which were 10-50 km away from the referral center. Study by Goswami. P *et al*. [9] also showed that the majority of patients (64.75%) travelled less than 50 km to reach the referral center. The most common indication with which patients were referred in our study was Anemia of varying degrees (15.77%) followed by preeclampsia (9.86%), previous LSCS (8.87%), preterm labor pains with non-availability of NICU (8.08%), breech presentation (7.69%), prolonged LPV(6.11%), MSL(5.12%), severe oligohydramnios (4.33%). This finding is contrary to the findings of study conducted by Rathi *et al*. [10] where it was noted that majority of the cases were referred for hypertensive disorders of pregnancy (26%), preterm labor (26%), and medical disorders complicating pregnancy (21%).The most common mode of transport used by the patients to reach referral center was hospital ambulance (59.9%) followed by private vehicles (29.58%). It was found that most of the patients (67.8%) reached the referral center within 6 hours of referral while it took almost 6-12 hours for 24.45% of patients. Rest of them took more than 12 hours to reach their destination. As per study done by Rathi *et al*. [10], 49% of patients reached the referral center within 8 hours. In our study it was observed that a total of 34 patients had a delay in reaching the referral center. In majority of them (52.9%), the commonest reason for delay was their referral to an intermediate center followed by poor transport facility (20.58%), ignoring the warning signs (17.64%). It is in association with a study done by Maitra *et al*. [11], where the transport problem as the reason for delay in referral was found in 14.6% -32.79% patients and negligence of patient and family members in 2.5% - 8.5%. It was found that the majority of patients (49.9%) in our study had normal vaginal delivery while 130 cases (25.64%) were managed conservatively. In 102 patients (20.11%), Caesarean section was undertaken due to various indications. Among patients who underwent caesarean section, one patient had caesarean hysterectomy after caesarean section. Seven (1.38%) patients had assisted vaginal delivery. Rest of the patients underwent other procedures like Suction & evacuation, aborts expulsion, etc. This finding is in correlation with study done by Goswami P *et al*. [9] where 48% of patients had vaginal delivery, 28% had caesarean section, and 24% were managed conservatively. In our study five (0.99%) Maternal deaths were reported however slightly higher maternal deaths (1.55%) were reported by Sharma.S *et al* [12]. In the current study, it was observed that the majority (80.9%) of the neonates were shifted to the mother side whereas 15.74% of neonates were admitted to the NICU. This finding was lower than the findings of study done at Karachi [13] where 26.5% neonates were shifted to NICU.

Conclusion

In our study, it was observed that 36% of patients were referred from the Primary Health Centers and Community Health Centers. These direct referrals to tertiary care hospitals can be avoided by first availing the emergency obstetrical services available at secondary care hospitals i.e. District Hospitals. This will prevent unnecessary rush of patients at tertiary institutions. Similarly, the patients shall be encouraged to use hospital ambulances during transportation instead of private vehicles, as the hospital ambulances are well equipped to deal with any emergency during transportation. Hence, referral systems form an integral part of healthcare. Identification of high risk patients, their timely referral and management can reduce significant amount of fetomaternal morbidity and mortality. It can be achieved by training of health care workers, health education and prompt referral and starting of treatment and thereby progressing towards achieving the goal of ideal MMR and Neonatal Mortality rate.

Conflict of Interest: None

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