

Fetomaternal Outcome in Referral Obstetric Patients in Tertiary Care Hospital

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ABSTRACT

Aim and objective: To identify indication and fetomaternal outcome of emergency obstetric referral to our hospital so as to reduce fetomaternal morbidity and mortality.

Materials and methods: This retrospective observational study was done at the Department of Obstetrics and Gynecology, LTMMC and LTMGH, Sion, Mumbai, for a duration of 1 year from January 2020 to December 2020. All referred patients in emergency for obstetrics indications above 20 weeks were analyzed for fetomaternal outcome and their indication of referral.

Results: In our study, of a total of 7,751 delivered patients, 2,233 (28.8%) cases were referred. Maximum 1,711 (76.6%) cases were in the 21–30 years age-group and (66.86%) cases referred from secondary centers. The most common referral indication was fetal, meconium-stained amniotic fluid, and fetal distress 432 (19.4%), followed by preterm labor 291 (11.1%) as maternal indication. One thousand seven hundred twenty-seven (77.4%) patients delivered by lower segment cesarean section. Maternal morbidity was seen in 370 (16.6%) patients, of which 41 (11%) patients required intensive care unit admission. Maternal mortalities were 12. Total 1,832 (80.8%) neonates were shifted to mother and 325 (14.3%) required NICU admission.

Conclusion: To reduce unnecessary referrals and burden on tertiary care hospitals, first referral units (FRUs) should be strengthened and healthcare workers should be trained in essential and emergency obstetric care, which will help in reducing morbidity and mortality.

Keywords: Fetomaternal outcome, Maternal morbidity, Maternal mortality, Referral cases.

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INTRODUCTION

Pregnancy is a normal physiological process. Low-risk pregnancy can be managed by primary healthcare centers. Regular antenatal visits and follow-up can identify high-risk factors, and early referral of such pregnancy to higher centers will avoid complications and may help to reduce fetomaternal morbidity and mortality. The present study was carried out to know the fetomaternal outcome and indications of emergency obstetric referrals to tertiary hospitals.

The RMNCH+A strategy is aimed at reproductive, maternal, newborn, child, and adolescent health under a broad umbrella and focusing on the strategic lifecycle approach to improve child survival in India.¹ One of the “plus” within the strategy focuses on ensuring linkages, referrals, and counter-referrals between and among various levels of the healthcare system to create a continuous care pathway, and to bring an additive/synergistic effect in terms of overall outcomes and impact.¹

The referral system is the basis of the healthcare delivery system.² The term referral is used to indicate the recommendation of a healthcare provider at one level of the health system, having limited resources (medications, equipment, skilled professional) to manage a clinical condition for the assistance of an improved resourced facility, which is of similar or higher level to assist in or take over the management of patient.³ Usually, referral occurs in upward movements, i.e., persons are referred to higher institutions.⁴

Referrals in obstetrics can be categorized depending on type of healthcare facility (primary, secondary, tertiary, private), timing (antenatal, intranatal, or postnatal), and urgency (elective or emergency).² Non-standardization of obstetric care at primary healthcare system and bypassing secondary healthcare system to get specialty services leads to unnecessary referrals to tertiary

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centers. Private hospitals shift high-risk pregnancies to avoid poor outcomes. As a result, tertiary centers are overcrowded with both high-risk and normal deliveries. This dilutes the quality of care, which would otherwise be provided for more critical conditions.⁵

The Government of India has introduced the referral system to improve the service delivery and reduce workload at tertiary healthcare facilities, allow maximal utilization of healthcare facilities, strengthen peripheral infrastructure, improve teaching standard, and promote research activities.⁶ The present study was carried out to evaluate the maternal and fetal outcomes of such emergency obstetric referrals.

MATERIALS AND METHODS

This retrospective observational study was done at the Department of Obstetrics and Gynecology, LTMMC and LTMGH, Sion, Mumbai, for a duration of 1 year (from January 2020 to December 2020).

Aim and Objective

To study indication and fetomaternal outcome (morbidity and mortality) of emergency obstetric referral patients.

Inclusion and Exclusion Criteria

All emergency referred antenatal and intranatal patients to our tertiary hospital are included. All registered antenatal cases, postpartum and gynecological referrals are excluded.

Methodology

Data were collected from case records and medical record books of hospital. The cases were analyzed with respect to obstetric profile, referral center and indication of referral, maternal and fetal morbidity and mortality. This study was cleared from the Institutional Ethics Committee. Data were entered in Google Sheets and analyzed using SPSS version 22.

RESULT

This was a retrospective observational study of 2,233 referred cases as per inclusion criteria during the study period from LTMMC and LTMGH, Sion, Mumbai. According to our study, out of a total of 7,751 delivered patients, 2,233 (28.8%) cases were referred.

As shown in Table 1, there were a total of 2,233 (28.8%) referred cases. Age-group 21–30 years was the commonest in 1,711 (76.6%). There were 1,051 (47%) primigravida and 1,182 (53%) multigravida. One thousand one hundred forty (51%) cases were in the gestational age-group of 37–40 weeks, and 947 (42.4%) were in gestational age-group of less than 34 weeks. The lower segment cesarean section 1,727 (77.4%) was the commonest mode of delivery, and 493 (22%) patients had vaginal delivery.

Table 2 shows that the commonest referral indications were maternal obstetric 1,299 (58.17%), which includes preterm labor 291 (13.1%) and previous LSCS 262 (11.7%). Fetal indications were 718 (32.15%), which includes meconium-stained amniotic fluid with fetal distress 432 (19.4%), and 234 (10.5%) intrauterine growth retardation with oligohydramnios with unfavorable USG Doppler.

Maternal medical conditions were 284 (12.71), including preeclampsia (4.3%), GDM (3.6%), and anemia (2.6%).

As shown in Table 3, majority of cases 893 (40%) were referred from secondary referral centers (specialty hospitals), 787 (35.2%) cases were referred from primary health centers (maternity homes), 185 (8.3%) from private hospitals, and 26 (1.2%) from tertiary centers.

There were 342 (15.3%) patients referred from other than referral linkage.

Table 4 shows, out of all 2,233 cases, there were 370 (16.6%) cases of maternal morbidity. Out of 370 complications, 100 (27%) patients required blood transfusion. There were 59 (15.9%) cases of anemia, 43 (11.6%) cases of eclampsia, and 20 (5.4%) cases of postpartum hemorrhage. Forty-one (11%) patients required ICU admissions and ventilatory support. Fifteen (4%) cases had acute renal failure, and 16 (4.3%) had disseminated intravascular coagulation. In two cases, obstetric hysterectomy was done for atonic postpartum hemorrhage, and in three cases, vaginal exploration was done for vaginal wall hematoma.

Maternal mortality was seen in 12 cases. The most common obstetric causes were eclampsia and HELLP syndrome. Out of

Table 2: Indications of referrals

Indications	2,233 (%)
Maternal obstetric indication	1,299 (58.17)
Preterm labor	291 (13.1)
Previous LSCS (one or more)	262 (11.7)
Postdatism	198 (8.9)
Premature rupture of membranes	118 (5.3)
Non-progress of labor + deep transverse arrest	83 (3.8)
Cephalopelvic disproportion	81 (3.6)
Malpresentation	60 (2.7)
Antepartum hemorrhage	58 (2.7)
Twins	34 (1.5)
Labor	25 (1.1)
Bad obstetric history	14 (0.7)
Seropositive	4 (0.2)
Genital warts	1 (0.05)
Maternal medical conditions	284 (12.71)
Preeclampsia	97 (4.3)
Gestational diabetes mellitus	80 (3.6)
Anemia	59 (2.6)
Eclampsia	43 (1.9)
HELLP	4 (0.2)
Heart disease	1 (0.05)
Fetal indication	718 (32.15)
MSAF + fetal distress	432 (19.4)
IUGR oligohydramnios with Doppler changes	234 (10.5)
Intrauterine fetal distress	48 (2.1)
Cord prolapse	4 (0.2)

Table 1: Obstetric profile

Age-group (years)	Number 2,233 (%)
<21	234 (10.5)
21–30	1,711 (76.6)
>30	288 (12.9)
Parity	
Primipara	1,051 (47)
Multipara	1,182 (53)
Gestational age (weeks)	
<37	947 (42.4)
37–40	1,140 (51)
>40	146 (6.5)
Mode of delivery	
Vaginal delivery	493 (22)
LSCS	1,727 (77.4)
Instrumental delivery	13 (0.6)

Table 3: Referral center

Center	Number 2,233 (%)
Primary HC	787 (35.2)
Secondary center	893 (40)
Tertiary	26 (1.2)
Private	185 (8.3)
Other than referral linkage	342 (15.3)

Table 4: Maternal morbidity and mortality causes

<i>Causes</i>	
Maternal morbidity	Numbers 370 (%)
Anemia	59 (15.9)
Eclampsia	43 (11.6)
ICU admission	41 (11)
Blood transfusion	100 (27)
Ventilatory support	41 (11)
PPH	20 (5.4)
Obstetric hysterectomy	2 (0.5)
Vaginal exploration	3 (3)
ARF	15 (4)
DIC	16 (4.3)
Infection	30 (8.1)
Maternal mortality causes	Number 12
1	Disseminated TB + COVID-19
2	PPCM + pneumonia + septic shock
3	Pulmonary edema
4	Pneumonitis + sepsis + COVID-19
5	PPH/PTE/PPCM + COVID-19 + HELLP syndrome
6	PPCM + HELLP syndrome + COVID-19 + hepatitis A
7	CVA + eclampsia + COVID-19
8	ARDS + HELLP syndrome + hepatitis E
9	DIC
10	Lung collapse + PPCM
11	Hypovolemic shock + eclampsia
12	Hemorrhagic shock + PPH + ATN

Table 5: Fetal outcome

<i>Outcome</i>	
Neonatal outcome	Number 2,267 (%)
Shifted to mother	1,832 (80.8)
NICU	325 (14.3)
Stillbirth	110 (4.9)
Neonatal birth weight (kg)	
≤2.5	1,116 (49.2)
>2.5	1,151 (50.8)

12 cases, 5 had COVID-19 infection. Three patients had postpartum cardiomyopathy (PPCM). Infections like tuberculosis (1) and hepatitis (2) also resulted in mortality.

As shown in Table 5, there were 34 cases of twins. So total birth count was 2,267, out of which 1,832 (80.8%) babies shifted to mother without any complication, 325 (14.3%) required NICU admission, and 110 (4.9%) had stillbirth. One thousand one hundred fifty-one (50.8%) neonates had birth weight more than 2.5 kg, and 1,116 (49.2%) neonates had birth weight up to 2.5 kg.

DISCUSSION

In this study, there were 7,751 total deliveries, out of which 2,233 (28.8%) cases were referred, which is comparatively more than studies done by Jakhar and Choudhary⁶ (9.96%), Ghardallou et al.⁷ (15.23%), and Shenoy et al.⁸ (7.03%).

Obstetric Profile

In the present study, most of the patients (76.6%) were in the age-groups of 21–30 years, which is similar to studies done by Jakher and Choudhary⁶ (73%), Shenoy et al.⁸ (73.4%) and less as compared to studies done by Lakshminarayanan et al.⁵ (81.6%) and Roy et al.⁹ (86.8%). In our country, due to early marriages, maximum pregnancy occurs between 21 and 30 years of age. In this study, primigravida comprises (47%) of cases, which is in contrast to studies by Lakshminarayanan et al.⁵ (66.5%) and Roy et al.⁹ (62%). In our study, 57.6% of cases had gestational age of more than 37 weeks, which is less in comparison with studies by Lakshminarayanan et al.⁵ (83%) and Roy et al.⁹ (78.5%). Lower segment cesarean section required as mode of delivery in (77%) cases similar to Shenoy et al.⁸ (83%).

Referring Centers

Among the 2,233 referred cases, 893 (40%) cases referred from secondary centers (specialty hospitals), 787 (35.2%) from primary health centers (maternity homes), 185 (8.3%) from private hospitals, 26 (1.2%) from tertiary centers in contrast to Lakshminarayanan et al.⁵ study (38%) were referred from PHCs, (15%) secondary HC, (30%) tertiary hospitals, and (17%) private hospitals. Jakher and Choudhary⁶ and Roy et al.⁹ studies had (0.88%) and (14%) referrals from private hospitals.

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. There were 342 (15.3%) patients referred from other than

referral linkage to our hospitals. During the COVID pandemic, many peripheral hospitals were converted into COVID hospitals, which affected antenatal care. Because of the lack of antenatal OPD and delivery services, many antenatal patients are directly referred to tertiary hospitals.

Referral Indications

The most common referral indications were maternal obstetric 1,299 (58.17%), which includes preterm labor 291 (13.1%) and previous LSCS 262 (11.7%). Fetal indications were 718 (32.15%), which includes meconium-stained amniotic fluid with fetal distress 432 (19.4%), and 234 (10.5%) intrauterine growth retardation with oligohydramnios with unfavorable USG Doppler.

Maternal medical conditions were 284 (12.71), including preeclampsia (4.3%), GDM (3.6%), and anemia (2.6%).

Lakshminarayanan et al.⁵ reported that the majority of indications were obstetric (76.3%), fetal (8.5%), and medical (12.8%). Jakher and Choudhary⁶ had referral indications labor 893 (40%) cases, (11.44%) previous LSCS, and (7.3%) preeclampsia.

Gupta et al.¹⁰ study had the majority of cases referred for anemia (18.05%), hypertensive disorders of pregnancy (22.27%), and malpresentations (15.19%).

The reasons for referral include the need of a neonatal intensive care unit for preterm and IUGR, medicine expert and intensive care unit to manage high-risk pregnancy, lack of blood bank services. Other reasons include lack of emergency operation theater services, lack of anesthetist, and pediatrician.

Maternal Morbidity

In this study, there were 370 (16.6%) cases of maternal morbidity. Out of 370 complications, 100 (27%) patients required blood transfusion. There were 59 (15.9%) cases of anemia, 43 (11.6%) cases of eclampsia, and 20 (5.4%) cases of postpartum hemorrhage. Forty-one (11%) patients required ICU admissions and ventilatory support. Fifteen (4%) cases had acute renal failure, and 16 (4.3%) had disseminated intravascular coagulation. In two cases, obstetric hysterectomy was done for atonic postpartum hemorrhage, and in three cases, vaginal exploration was required for vaginal wall hematoma.

Jakhar and Choudhary⁶ had (5.3%) ICU admissions less compared to our study. There were (51.09%) anemia, 38 (20.77%) eclampsia, (18.20%) PPH, and six cases of obstetric hysterectomy. Study by Goswami and Makhija¹¹ showed that (12.34%) required ICU admissions. ICU admission rate in our study was higher than that of Sailaja and Renuka.¹²

All high-risk obstetric patients require a multidisciplinary approach with intensive care unit monitoring, medicine expert, and facilities for investigations, blood banks, and interventions if required. The morbidity was higher in referred patients because of inadequate antenatal care, failure to identify, and timely referral of high-risk obstetric patients antenatally. These morbidities are avoidable by providing adequate and proper antenatal care and timely referral to tertiary level.

Causes of Maternal Mortalities

In this study, maternal mortality was seen in 12 cases. The most common obstetric causes were eclampsia and HELLP syndrome. Out of 12 cases, 5 had COVID-19 infection. Three patients had postpartum cardiomyopathy (PPCM). Infections like tuberculosis (1) and hepatitis (2) also resulted in mortality.

Jakhar and Choudhary⁶ reported nine mortalities, and Gupta et al.¹⁰ reported 40 (2.72%) mortalities; common causes were hypertensive disorder (35%), severe anemia (20%), hemorrhage (20%), sepsis (10%), and medical disorders like malaria and hepatitis. According to Narsaria et al.,¹³ patients came with eclampsia that is a major preventable cause of maternal mortality.

The above studies show that hypertension and anemia are the most common causes of maternal mortality.

Fetal Outcome

One thousand eight hundred thirty-two (80.8%) babies shifted to mother without any complication, 325 (14.3%) required NICU admission, and 110 (4.9%) had stillbirth. Ghardallou et al.⁷ reported (98.2%) live birth, (1.8%) stillbirth, and (9.3%) NICU admission. Akaba and Ekele¹⁴ reported (16.4%) stillbirth. One thousand one hundred fifty-one (50.8%) neonates had birth weight more than 2.5 kg, and 1,116 (49.2%) neonates had birth weight up to 2.5 kg.

CONCLUSION

Referral helps healthcare seekers to reach a high level of care in the health system in a span of time. Identification of high-risk factors by health personnel and timely decisions about intervention is important.

In order to reduce unnecessary referrals and burden on tertiary care hospitals, strengthening of existing first referral units (FRUs) is necessary to provide better services, which include the provision of emergency obstetric services with 24 × 7 availability of operation theater facility, anesthetist, pediatrician, and blood bank facility.

Healthcare workers should be trained well in essential antenatal and emergency obstetric care. We must give emphasis on the correction of anemia and early diagnosis of hypertension in the antenatal period. Measures like routine blood pressure and hemoglobin estimation, iron and folic acid supplementation, early ANC registration, deworming, and educating women about contraception and birth spacing will reduce fetomaternal morbidity and mortality.

Every woman has the right to get good quality health care, and to achieve this, we should update our practice of maternal and child health (MCH) care services.

CLINICAL SIGNIFICANCE

Strengthening of the referral system is essential to improve fetomaternal outcome.

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