

What necessitates obstetric transfers? Experience from a secondary care hospital in India

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ABSTRACT

Background: India attributes to about 15% of the maternal mortality globally. Many a time poor maternal and neonatal outcomes occur unanticipated during intrapartum and postpartum period. An efficient referral system identifies the indications necessitating prompt referrals besides ensuring patient friendliness and continuity of care. **Methodology:** The descriptive, retrospective study was done in a secondary care hospital of a teaching institution in South India, run by primary care physicians, obstetricians and pediatricians. It describes the referrals from labour room in a year, identifying the referral rate, indications, maternal and neonatal outcomes. **Results:** The referral rate was found to be 3 per cent. The most common indication for the referrals was hypertensive disorders of pregnancy (54.5 percent). Among the women referred, there were no maternal deaths and majority had uncomplicated postpartum period. Eleven women developed postpartum hemorrhage. Neonatal outcome reflected a good trend as 83 per cent had an uneventful hospital stay. There were eight early neonatal deaths. **Conclusion:** The hospital could reduce the referral load to its tertiary care due to adequate training of primary care post graduates in basic obstetrics and anaesthesia skills, establishing standardized referral protocol and monitoring with regular clinical audits. Patient experience could be improved with inter referral unit communication and linking the health information system.

Keywords: Antenatal referral, India, indication, maternal, neonatal outcomes, pregnancy

Introduction

The maternal deaths in India have declined from 215/100,000 births in the year 2010 to 174/100,000 in 2015. Still, India contributes to about 15% of the maternal mortality globally.

Since most of the complications occur unanticipated, during labour, delivery and the first 24 hours postpartum, an effective Emergency Obstetric Care (EmOC) service has been shown to decrease the maternal mortality rate as well as morbidity. Studies done in India and various parts of the world have shown that

the incidence of obstetric emergencies varies between 4.8% to 25%.^[1-3]

The National Health Mission aims at achieving universal access to equitable, affordable quality health care and hence reduce maternal Mortality Rate (MMR) to 1/1000 live births and reduce Infant Mortality Rate (IMR) to 25/1000 live births.^[4] Janani Suraksha Yojna (JSY) is an initiative which support women for safe institutional confinement using a well-connected and up-graded referral unit system.^[5]

While level 1 and level 2 care aim at providing services to low risk, Basic Obstetric and Neonatal Care, Level 3 unit is marked by 24 × 7 Emergency surgery facility and Comprehensive Emergency Obstetric and New born Care facilities. Further

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complications are referred to tertiary care centres (Medical Colleges).^[5] It also necessitates a well-equipped and staffed ambulance for transfer. Referrals bypassing level three unit to a tertiary care centre increases burden to tertiary care centres. Given the highly skewed distribution of facilities and resources in the private sector, state led partnerships with the private sector is important alongside strengthening the public sector.^[6]

An efficient referral system provides access to treatment and skills at different levels of expertise by linking these systems.^[5] Decision on referral depends on various factors extending from a well-equipped infrastructure and skilled health professionals of the referring unit till the cost, feasibility of travel and person to accompany on the patient side.^[7] Problems identified with referrals from peripheral health centres included low skills and confidence of staff, reluctance to induce labour, confusion over the clinical criteria for referral, non-uniform standards of care at referral institutions, a tendency to by-pass middle level institutions, a lack of referral communication and supervision, and poor compliance. Inadequate referral communication and low compliance, contribute to delays in the provision of emergency obstetric care.^[6]

The study was done in a secondary care peripheral hospital of a medical college in South India which trains primary care physicians (community health and family medicine) post graduates in basic obstetric and anaesthesia care. It documents the experience of referrals expressed as referral rate, indications and maternal and neonatal outcomes.

Methodology

Study setting and design

A retrospective, descriptive study was done in the year of 2016, about the referrals from the labour room of the hospital.

The hospital provides secondary care level of service and is run by the community health department, providing general medical services to rural and tribal areas. There are monthly community outreach clinics. Nevertheless, to mention in the context of the study, there are dedicated antenatal out-patient service, 120 bedded in-patient service, emergency, labour room, neonatal wards and operation theatre.

Generally, the referral unit is the tertiary care centre of the medical college, for the advantage of a well-established communication system with the peripheral care units ensuring continuity of care for the patient. However, the decisive factor is patient's choice.

Antenatal referrals are two-tier. First tier referral happens during antenatal out-patient visits (could be outreach clinic also) for indications such as placenta previa at term, severe heart diseases of NYHA grade 3 and 4, arrhythmias, active bleeding disorders, maternal autoimmune diseases, APLAS, uncontrolled Diabetes Mellitus, Rh isoimmunisation, morbid obesity and more than two previous caesarean sections. Services like blood bank and

intensive care unit with ventilator supports are not available in the hospital premise; such services are availed from the main hospital which is around 5 km away. Women who possibly requiring any of these services are referred in advance.

The second-tier screening and referrals happen in the labour room. The labour room admits all obstetric emergencies beyond the gestational age of 28 weeks. The referral systems in the labour room are characterized by the following facilities:

1. Adequate documentation using a referral book having counterfoil
2. Appropriate stabilisation of the patient prior to referral
3. Easy follow up and continuity of care through a well-established electronic medical record system webbing the main hospital and peripheral hospitals
4. Monitoring by monthly audits to avoid unnecessary referrals and improvement of referral system
5. Standard protocol-based referral which is followed most of the time.

The following are the indications and protocols for referral:

- a. Pre-eclampsia- term or pre-term woman in early labour with two readings of BP more than or equal to 160/110 mm hg with urine albumin dipstick test indicating 2+ or more or with signs of impending eclampsia are referred. Loading dose of Magnesium sulphate is administered prior to referral
- b. Antepartum Haemorrhage- Abruption and unclassified APH are referred from the Labour room
- c. Prematurity- Preterm labour less than 32 weeks and prelabour preterm rupture of membranes which cannot be conservatively managed are referred for neonatal care. The women who are preterm at the time of referral are given at least one dose of steroid for facilitating neonatal lung maturity
- d. Chorioamnionitis - Chorioamnionitis is diagnosed clinically if there is intrapartum maternal fever more than 100.8 F, fetal or maternal tachycardia along with elevated leucocyte count. If such patients are in early labour, they are at times referred at the discretion of the treating physician
- e. Sudden onset of heart failure.
- f. Bleeding disorders

Few referrals are left to the duty physician's discretion. Physician discretion is based on an individual physician's competence and comfort level in managing a high-risk patient at that particular point.

Study population and duration

All patients referred from the labour room from January to December 2016.

Data collection

Data collection was done after the approval of the institutional research review and ethical committee board on 29-03-2017 (IRB Min No: 10599 (Retro)). Patients who were referred each month were enlisted from the monthly referral audits.

The required details of each patient were retrieved from the labour room registers, discharge summaries, counterfoils of referral letter and electronic medical records. Parity, risk factors, indication for referral, pre-referral management, referral centre, maternal, neonatal outcomes were captured. Information of each patient was recorded in a separate form which was assigned an identification number to ensure the privacy. Those patients enlisted in the monthly audit with unrecoverable details, despite the various source search, were excluded from the study.

The annual antenatal data of the year 2016 was retrieved from the computer data base of the hospital in order to complete the picture of the referral data collected.

Data analysis

The data was entered in the Epidata software. Descriptive statistical analysis was done using using Statistical Package for the Social Sciences (SPSS) version 16 (SPSS-Inc., IBM, USA). The results were expressed in percentage and proportion.

Results

Overview of the antenatal statistics and referral in 2016

The year of 2016 was marked by 18740 registrations to the regular antenatal clinic in the OPD. The outreach clinics covering the 82 villages had 1954 women registered. The high -risk clinic had 3337 visits with 867 new registrations. The total deliveries that were conducted in labour room were 3264. Among the women who had visited the Labour Room in the year 2016, 101 were transferred to any higher centre.

The referral rate from the Labour Room was found to be 3% of which 98% were transferred to the Labour Room of

the concerned referral unit. Two women opted to go to the government hospital.

Ninety-eight referred women were in the age category of 19 to 35 years; the mean age of women was 24.4 years. Majority of the women referred, were primigravida (67.3%). Six women had twin gestation. At the time of referral, 56 women were term and 34 women were moderate preterm.

Pre-referral profile

The most common indication for the referrals was hypertensive disorders of pregnancy (54.5 percent, Table 1). Out of the 184 women presented with hypertensive disorders of pregnancy in the labour room during the year of study, 55 (29.9 percent) were referred to a higher centre. Among the referred patients, 32 women received magnesium sulphate loading dose and 14 women received an anti- hypertensive prior to referral.

At the time of referral, 34 women were moderate preterm. However, only 15 women were referred to the main centre for the prematurity of the baby. The rest were referred for other indications. Around 20 women received at least one shot of Betamethasone.

Five women were referred for suspected chorioamnionitis. Four of them were confirmed in the referral centre.

Post referral maternal outcomes

There were no maternal deaths among the referred patients.

Among the women referred to the main centre, 48 percent delivered by Caesarean Section; [Table 2].

67 women had no postnatal complications. Eleven women developed postpartum hemorrhage, of which three needed

Table 1: Indications for the transfer

Indications	Total Patients managed in labour room for the indications in 2016 (n=599)	Number of patients referred under each indication in 2016 (n=101)
I OBSTETRIC CAUSES		
Hypertensive disorders of pregnancy		
a. Gestational HTN	76	6
b. Pre-eclampsia	49	47
c. Eclampsia	4	2
Gestational diabetes mellitus	207	1
APH	7	6
Prematurity	184	15
Severe IUGR	43	3
Chorioamnionitis	10	5
II HIGH ANAESTHETIC RISK		
Morbidly Obese		1
Heart disease	18	1
Post craniotomy	1	1
Incomplete data		3
**Others		10

**Others include patient with fever and thrombocytopenia or blood disorders, Rh isoimmunisation allergic reaction to oxytocin, blood stained vomitus, pulmonary edema of unknown causes, altered sensorium, physician's discretion

surgical intervention. Retrospectively, the three who needed surgery were referred for other reasons such as severe pre-eclampsia and antepartum haemorrhage.

Three women referred for severe pre-eclampsia were confirmed to have HELLP syndrome and three women had to be on antihypertensives for few days postnatally. One lady had postnatal eclampsia during her hospital stay.

Three women developed urinary tract infection.

Among the referrals, six ladies were diagnosed with chorioamnionitis. Out of the six women, four had their referral indication as possible Chorioamnionitis. Two women were later diagnosed to have chorioamnionitis post referral.

Rare postnatal outcomes included postpartum cardiomyopathy in a lady referred for heart failure; aplastic anaemia in a lady and dengue fever in another lady, both referred for severe thrombocytopenia.

Post referral neonatal outcomes

Among the babies delivered to the women transferred, 83 per-cent (88) had an uneventful hospital stay.

Among the referred patients 8.4% had stillborn babies and 7.5% had early neonatal deaths [Table 3]. However, these events were lesser among those delivered in the base hospital.

There were eight early neonatal deaths and ten stillborn. Among the early neonatal deaths, sepsis was the cause of death in three cases, extreme prematurity in four cases and severe intrauterine growth restriction in one case.

Table 4 describes the birth weight of babies born with respect to their maturity.

The number of babies with adequate birth weight was 46 of which three were moderately pre-term (32 weeks-36 weeks and 6 days).

Table 2: Mode of delivery of the referred patients in comparison to those who delivered in base hospital labour room

Type of delivery	Patients in labour room in 2016 (%) (n=3264)	Referred patients (%) (n=101)
Normal vaginal	68.1%	26.7%
Instrumental	15.2%	22.8%
Caesarean	16%	47.5%
Assisted Breech	0.7%	2%

*Details of one patient not available as she refused management at the referral centre

There were 6 babies of extreme low birth weight (less than 1 kg) which were found to be in the gestational age 28-31 weeks.

Discussion

Despite, referral not being a negative outcome, it is an important intervention in the course of labour and it affects the birth experience of the woman involved.^[8]

The referral rate as against the number of deliveries in the institution is 3.1 percent which fairly simulates the finding observed in a study conducted by Chaturvedi *et al.* in Madhya Pradesh reporting 5.8 percent among 96 health facilities of different tiers.^[7] However, in a study conducted by Sashi Kant *et al.* in a secondary hospital in Haryana in 2015, the referral rate was found to be 31.7 percent.^[9]

Pre-eclampsia was found to be the most frequent indication (46.5%) in this study. Similar results were observed in most recent studies in Gujarat (16 percent)^[10] and in Uttarakhand by Goswami *et al.* (19.48 percent).^[11] Singh and Nandi have mentioned the most common obstetric emergency faced in their tertiary referral centre as eclampsia which was followed by postpartum haemorrhage.^[2] Anecdotaly, eclampsia among these referred patients was very low in our setting. Possible explanation could be the early referral and administration of prophylactic dose of magnesium sulphate before referral.

The study by Sashi Kant *et al.* mentioned that nearly one-third of referrals were due to preterm labour.^[9] The study reported only 13.9% referrals for pre-term; possibly the hospital was able to manage uncomplicated preterm babies weighing 1800 g and beyond, due to availability of paediatricians and collaboration with the neonatology unit of the medical college.

The most frequent mode of delivery among the women transferred was by Caesarean Section (48 percent). The vaginal delivery rate was slightly higher than 35 percent in the study by Goswami *et al.*^[11] and much lower than the 78 percent in the study by Devineni *et al.*^[12] The outcomes for both the mother and the baby were good despite the high risk conditions.

Assessment of CEmOCs in various states of India have shown that the number of complicated deliveries handled at referral institutions is far below the estimated need of around 15% of all pregnancies and 100% of all complications.^[13] This may be due to inability to refer in time or unnecessary referrals of even normal pregnancies. This study shows the significance of early identification of high-risk factors and timely referral. A study

Table 3: Neonatal outcomes among the referrals with respect to the deliveries in base hospital labour room

Category	Among delivered in hospital (n=3264)	Among referred (%) (n=107, includes twin delivery)
Stillborn	1.5%	8.4%
Early Neonatal Death	0.5%	7.5%
Alive	98%	84.1%

Table 4: Weight of the baby delivered in the referred hospital

Birth weight (grams)	Preterm (<37 weeks)	Term (≥37 weeks)	Total (%)
<1000	6	0	6 (5.6)
1000-1499	11	1	12 (11.2)
1500-1999	16	2	18 (16.8)
2000-2499	13	11	24 (22.4)
≥2500	3	44	46 (43.1)
Missing data	1		1 (0.9)
Total			107 (100)

done in obstetric referral unit in Puducherry found that 56% of the patients were referred from primary care units.^[14] It is imperative to strengthen the primary care physicians in the training of basic obstetrics and anaesthetic skills. The hospital could manage most of the patients and keep the referral rate low because of fair consensus among the doctors which included trained family physicians. The management of most emergencies requiring expertise were supported by anaesthetists, obstetricians and paediatricians. It's also important to look at the adherence to the protocols by the referring unit before the referral and maintain a referral letter with required details as recommended by RCH programme.^[15]

Recommendations

1. Developing and revising a standardised protocol for indications, pre-referral treatment, referral process will improve maternal and neonatal outcomes.
2. Adequate training of primary care post graduates in basic obstetric and anaesthesia skills is essential to avoid unwarranted referrals.
3. Good connectivity between primary care doctors and referral unit doctors with a bidirectional feedback system could improve the overall patient experience.
4. Linking the health information system across the nation-including proper documentation, communication will bring in accountability.
5. A good government-private sector partnership will maintain continuity of care for the patient.

Limitations of the study

Details of those patients who were referred directly from the ward or outpatient department were not available.

The pregnancy outcome details of the patients referred to other tertiary care centres could not be followed up completely.

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Conflicts of interest

There are no conflicts of interest.

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