Original Article

Audit of emergency obstetric referrals from a secondary level hospital in Haryana, North India

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Abstract

Background: The maternal mortality ratio in India is high. An effective emergency obstetric care (EmOC) strategy has been identified as a priority to reduce maternal deaths. Since the capacity of different levels of public health facilities to provide EmOC is varied, an effective referral system is crucial. However, few studies have evaluated the functioning and quality of referral systems in India. A systematic monitoring of referrals helps to identify current gaps in the provision of essential obstetric care. **Objective:** This study was conducted to identify the medical and logistic reasons for emergency obstetric referrals from a subdistrict hospital (SDH). **Methods:** An audit of emergency referrals during the period January 2015–December 2015 was carried out. Records of all obstetric patients referred from the maternity ward during the study period were reviewed. **Results**: The referral rate was found to be 31.7%. Preterm labor (30.6%), pregnancy-induced hypertension (17%), and fetal distress (10.6%) were the main reasons for referral. Deficiencies were found in critical determinants of functionality, that is, nonavailability of emergency cesarean, neonatal care unit, and blood bank. **Conclusions:** The referral rate at the SDH was high. Lack of workforce and infrastructural facilities led to referrals of women who ought to have been managed at this level of the hospital.

Keywords: Emergency, maternal health, obstetric, referrals, secondary level hospital, subdistrict hospital

Introduction

India contributes to 15% of the global maternal deaths.[1] As per the data of the sample registration system, the maternal mortality ratio in India was 178/100,000 live births in 2012.[2] Although there has been a decrease of 16% in maternal mortality in the last two decades; however, maternal deaths in India still remain significantly high.[1,2] Since most of the maternal deaths occur during labor, delivery, and first 24-h postpartum, an effective emergency obstetric care (EmOC) strategy has been identified as a priority to reduce maternal mortality, near misses, and maternal morbidity. Obstetric complications are unpredictable and may prove fatal if appropriate medical care is not provided within a short window of time. Various studies conducted in India and other parts of the world have reported that the incidence of obstetric complications varies from 4.8% to 25% in different settings.[3-5] It is an accepted estimate that 15% of pregnant women will have obstetric complications and will require EmOC. An effective EmOC strategy will reduce maternal mortality and morbidity, as well as reduce the complications of childbirth, including birth asphyxia, which contribute to one-third of neonatal deaths. Taking cognizance of this fact, the Government of India initiated schemes such as *Janani Suraksha Yojna* (JSY), which envisage free maternity care services and a nationwide scale-up of institutional deliveries.

In India, the capacity of different levels of public health facilities to provide EmOC is varied. The primary health centers provide services for normal delivery and referrals for complicated cases. The community health centers (CHCs) and subdistrict hospitals (SDHs) provide specialist services and act as first

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referral units (FRUs) for providing EmOC, whereas tertiary care centers (district hospitals and above) are expected to handle complicated cases and referrals from FRU.[6]

An effective referral system is important to facilitate efficient transfer of patients to next level of care, particularly in case of obstetric emergencies. A systematic monitoring of referrals helps to identify current gaps in the provision of essential obstetric care. It also helps in identifying training needs of staff as well as logistic requirements for the provision of effective obstetric care, appropriate for a health-care facility. Despite the importance of an effective referral system, very few studies have evaluated the functioning and quality of referral systems in India. Although the studies are available regarding in-referrals to tertiary care hospitals in India, very few studies have analyzed the out-referrals from secondary level hospitals, which usually serve as FRUs and are an important link in emergency obstetric services.

Since the SDH, Ballabgarh, was FRU for the provision of EmOC, it was considered important to examine the characteristic and reason(s) for referral from this secondary level health facility. The present study was conducted with the objective to identify the common medical and logistic reasons for referral of obstetric patients from SDH, Ballabgarh.

Methods

In this record-based descriptive study, secondary analysis of routinely collected hospital data for the period January 2015 to December 2015 was carried out.

This study was conducted at SDH, Ballabgarh, which is a 50-bedded secondary level health facility under the comprehensive rural health services project, a collaborative project between an apex tertiary care institute and the Government of Haryana. The hospital provides services to Ballabgarh town with a population of around 187,000, and nearby areas of districts Faridabad and Palwal of Haryana. It also acts as FRU for nearly 97,000 population residing in 28 villages served by the institute. Every year >3000 deliveries are conducted at the SDH, Ballabgarh. Besides this, more than 1500 referrals take place. All delivery services are free of cost, and an ambulance is available round-the-clock for transport of patients. A team of senior and junior residents of various clinical disciplines, along with interns provide services under supervision of faculty members of the institute.

Records of all antenatal and postnatal women referred from the maternity ward of SDH, Ballabgarh, for the period of 1 year from January to December 2015, were reviewed. A referral register was maintained in the maternity ward. Information such as sociodemographic details of the patient, time of admission and time of referral, indication for referral, and prereferral treatment were recorded in this register. At the time of referral, a referral slip was given to the patient. Brief history of the patient, date of referral, indication for referral, prereferral treatment given, and name of facility to which the patient was being referred was mentioned on this referral slip. A copy of the slip was kept for record in the hospital.

From the referral register, information regarding profile of women being referred, clinical conditions requiring referral and logistic reasons for referral were retrieved.

Statistical analysis

Data entry was done in Microsoft Excel and analyzed using SPSS version 22 and R software. Descriptive statistics were applied to analyze indications for referral, profile of referred patients, and referral patterns. The results are expressed in percentages and proportions. Referral rates were calculated.

Ethical statement

Ethical approval for the study was obtained from the Institute Ethics Committee of the All India Institute of Medical Sciences, New Delhi (Ref no. IEC-177/01.04.2016).

Results

A total of 4868 women were admitted for delivery. Out of these, 3323 women delivered at SDH, Ballabgarh, and 1545 were referred. Thus, the referral rate was 31.7%.

Among the deliveries conducted at SDH, 3081 (92.7%) were normal vaginal deliveries, 68 (2.1%) were instrumental/assisted deliveries, and 174 (5.2%) were cesarean sections.

Table 1 shows the profile of women who delivered at SDH and those that were referred. Among the referred women, 723 (46.8%) were preterm, 713 (46.3%) were term, and 32 (2.0%) were postterm. Data were missing for 77 (5.8%) women. A total of 872 women with preterm pregnancy reported for delivery at SDH, Ballabgarh, of which 149 (17.1%) were delivered at SDH. Thus, the referral rate for preterm pregnancies was 83%, whereas it was 38.5% for postterm and 18.6% for term pregnancies. The referral rate for primigravid women was 33.6%, while it

Table 1: Profile of women delivered at or referred from subdistrict hospital, Ballabgarh

Variable	Delivered at SDH, *n* (%)	Referred from SDH, *n* (%)	Total	Referral rate (%)
Period of gestation				
Preterm	149 (4.5)	723 (47.0)	872	83.0
Term	3123 (94.0)	713 (46.3)	3836	18.6
Postterm	51 (1.5)	32 (2.0)	83	38.5
Missing data	Nil	77 (4.7)	77	
Total	3323 (100)	1545 (100)	4868	31.7
Primigravid	1134 (34.1)	573 (37.1)	1707	33.6
Multigravid	2041 (61.4)	761 (49.2)	2802	27.2
Grand multigravid	148 (4.5)	51 (3.3)	199	25.6
Missing data	Nil	160 (10.4)	160	
Total	3323 (100)	1545 (100)	4868	31.7

SDH: Subdistrict hospital

was 27.2% and 25.6% for multigravida and grand multigravida women, respectively [Table 1].

The medical indications for referral are shown in Table 2. The most common indication for referral was preterm labor, which accounted for 30.6% of all referrals. It was followed by pregnancy-induced hypertension, which contributed to 17% of the referrals. Fetal distress (10.6%), previous cesarean section (10%), malpresentation (8.5%), and nonprogress of labor (8%) were the other causes for referrals. Severe anemia was the cause of referral in 87 (5.08%) of women. Besides this, other maternal medical conditions such as asthma, diabetes mellitus, and high-grade fever were the cause of referral among 20 (1.3%) of women. In 168 (10.8%) women, there was >1 reason for referral. Out of nine postpartum women, five were referred because of PPH. Puerperal sepsis was the indication of referral in one woman. Other reasons included placenta accreta and birth trauma.

Nonavailability of neonatal intensive care unit (ICU) (56%), nonavailability of cesarean section (43.9%), and nonavailability of blood bank (5.6%) were the major logistic reasons for referral. Nonavailability of ICU (1.9%) was another other reason of referral [Table 3]. Majority of the women (75.8%) were referred to the district hospital of Faridabad (Badshah Khan Hospital), which was at a distance of 12 km from SDH. Twelve (0.7%) of the women were referred to Safdarjung Hospital, and four women (0.3%) were referred to the All India Institute of Medical Sciences, New Delhi. Both health facilities were situated at a distance of 35 km from SDH, Ballabgarh. No woman was referred to a private hospital. Data regarding place of referral were missing for 356 (23%) women.

Table 2: Indications of obstetric referrals among women admitted during the study period

Indication	*n* (%)
Preterm labor	472 (30.6)
Pregnancy-induced hypertension	262 (17.0)
Fetal distress	164 (10.6)
Previous LSCS	155 (10.0)
Malpresentation	132 (8.5)
NPOL	123 (8.0)
Severe anemia	87 (5.6)
IUGR	68 (4.4)
Antepartum hemorrhage	46 (3.0)
CPD	46 (3.0)
Others*	158 (10.2)

*Others included maternal medical conditions, multiple pregnancy, postdated pregnancy, and chorioamnionitis etc., (multiple options possible). NPOL: Nonprogress of labor; IUGR: Intrauterine growth retardation; CPD: Cranio-pelvic disproportion; LSCS: Lower segment cesarean section

Table 3: Logistic reasons for referral at subdistrict hospital, Ballabgarh

Reason	*n* (%)
Nonavailability of neonatal ICU	865 (56.0)
Emergency cesarean section not possible	678 (43.9)
Blood bank/storage facility not available	87 (5.6)
ICU not available	30 (1.9)
Patient not willing	1 (0.06)
Missing data	52 (3.4)

Multiple options possible. ICU: Intensive Care Unit

Discussion

We documented the magnitude and reasons for emergency obstetric referrals from a SDH. The referral rate was 31.7%, which was high for a secondary level health facility. Studies conducted at primary health facilities in India as well as other countries have reported the referral rates ranging from 15% to 28%.[7,8] In a study conducted in Madhya Pradesh by Chaturvedi *et al.* in 96 health facilities of different tiers, it was reported that out of 1182 mothers who arrived at a health facility during the 5-day study period, 5.8% were referred. The study also reported that secondary level health facilities sent out most of the referrals. In case of in-referrals to district hospitals, sending facilities were secondary level hospitals in 62% of cases, and primary level health facilities in 26% of the cases.[9]

Although data regarding referral rates from secondary level hospitals are scarce, the studies conducted among referred-in patients at tertiary care health facilities suggest that a large proportion of cases were referred from secondary level health facilities.[10,11]

The proportion of complicated deliveries managed at SDH was 7.3% (2.1% instrumental deliveries, and 5.2% cesarean sections), which was lower than the expected rate of about 15% of deliveries. Similar findings have been reported from earlier studies.[10,11] Thus, it appeared that SDH as a FRU for EmOC was underperforming. In a study conducted in six developing countries (including India), Ameh *et al.* also reported that very few facilities handled complicated cases and rates of emergency cesarean sections varied from 0.6% in Nigeria to 3.6% in Malawi.[12]

Nearly one-third of the referrals were due to preterm labor. The newborn stabilization unit which was available at SDH could have provided care for full-term newborns, and those weighing >1800 g. However, preterm neonates weighing <1,800 g, as well as a sick newborn would have required special newborn care unit (SNCU). This facility was not available at SDH. The latest guidelines suggest that all health facilities with >3,000 deliveries should have SNCU.[13] The absence of SNCU could have led to high referral rate for preterm women.

Other causes of referral included preeclampsia, history of the previous cesarean, fetal distress, and malpresentation. In their study, Chaturvedi *et al.* reported that 40% of referrals from CHCs were due to obstructed or prolonged labor. Other reported causes were leaking, hemorrhage, preeclampsia, and fetal distress.[9] Other studies have also reported that the patients were referred to tertiary care hospitals for conditions such as preeclampsia, hemorrhage, fetal distress, and prolonged labor.[10-12] The findings of previous studies were similar to our findings.

In the present study, higher rate of referrals may be due to the fact that there were constraints with respect to the availability of specialists and trained staff at the study facility. Only one senior resident (SR), each of the three core clinical disciplines (gynecology, anesthesia, and pediatrics), were posted at SDH. The SRs were not available on weekends, holidays, while on other official duties, and on account of personal leave. Even if only one of these three SRs was unavailable, the emergency cesarean sections could not be performed. Lack of sufficient numbers of specialists of core clinical disciplines led to unavailability of emergency cesarean section that was the reported cause of referral in 43.9% of instances. Thus, even those clinical conditions which were expected to be managed locally were referred by the SDH, putting avoidable extra burden on the tertiary care hospitals.

Other studies have also reported nonavailability of specialists for EmOC. Chaturvedi *et al.*, in their study, reported that when either an obstetrician or anesthetist was on leave, adequate cover was not provided due to lack of human resources; and hence, there were more referrals, including those from district hospitals to medical colleges.[9] In their study on referral system for EmOC in rural hospitals of Maharashtra, Quazi *et al.* also reported that nonavailability of specialists was a major hindrance for provision of EmOC.[14] Similar findings were reported by Sabde *et al.* in the study conducted in Madhya Pradesh.[15]

Apart from deficiency in workforce, there were logistic constraints as well. At the time of the study, the blood storage facility at SDH was nonfunctional. If the blood was required, then the blood sample of patient had to be sent to district hospital (12 km away) for grouping and cross-matching, and blood was provided if it was available at the district hospital.

Hence, patients with severe anemia, APH, and PPH had to be referred. Earlier studies have also reported that nonavailability of blood banks/blood storage facilities hampered provision of EmOC.[7]

Due to the absence of ICU, patients with preeclampsia, preterm labor, and severe anemia could not be managed at SDH. These factors also contributed to higher referral rate observed at SDH.

Studies conducted at tertiary care centers have also highlighted similar reasons of referrals among patients referred from secondary level to tertiary care hospitals.[10-12]

However, none of the studies, except one reported the absence of a neonatal intensive care unit as a reason for referral.[16]

As identified by the Ministry of Health and Family Welfare, the following three services are critical determinants of functionality-

1. EmOC, including surgical interventions such as cesarean sections and other medical interventions
2. Newborn care
3. Blood storage facility.[17]

SDH was deficient in all the three critical determinants of functionality identified in the Ministry of Health and Family Welfare.

In a study conducted in Jharkhand, it was found that although the health facilities were designated as FRUs; however, there were gross inadequacies with respect to infrastructure for labor rooms, blood storage facilities, and neonatal care units. It was also reported that there was deficiency in the availability of essential drugs at the designated FRUs.[16] In the present study, no woman was referred due to lack of essential medications.

In a qualitative study of maternity care in secondary level hospitals in Uttar Pradesh, Bhattacharyya *et al.* also reported that inadequate physical infrastructure and nonavailability of gynecologists and anesthetists were major challenges in provision of maternity care services.[18]

There were few limitations in our study. Follow-up of the referred women was not available. Hence, the outcome of referral, which is an important aspect of quality of referrals, could not be assessed. Moreover, being a secondary data analysis, there were missing data for some variables such as period of gestation, parity, and place of referral. There was no reason to suspect that women whose data were missing were systematically different from those whose data were included in the analysis. Hence, we feel that validity of the findings is not significantly vitiated.

Conclusions

This study highlighted that deficiency in all the three critical determinants of functionality had led to referrals of even those women who ought to have been managed at a SDH. Constraints such as nonavailability of human resources, infrastructure, and equipment at secondary level health facilities hamper the provision of EmOC. If these issues are adequately addressed, it would greatly enhance the capability of secondary level health facilities for providing EmOC. Strengthening of these facilities would also decrease the burden on tertiary care centers. In a country like India where institutional deliveries are promoted by way of conditional cash transfer schemes like JSY, ensuring EmOC at different levels of health facilities by upgradation of infrastructure and capacity building of staff is imperative.

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Conflicts of interest

There are no conflicts of interest.

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