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Original Research Article

Emergency obstetric care among referrals in more than 24 weeks gestation at a tertiary care teaching institution in Kerala, India

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ABSTRACT

Background: One of the biggest barriers confronting efforts to reduce maternal mortality through increased skilled delivery is access to emergency obstetric care. This study aimed to look into the profile of emergency obstetric referrals. Referral-decision interval, reasons and morbidities of referral were analysed and their neonatal outcomes assessed.

Methods: This observational study reviewed 90 emergency obstetric referrals over 3 years from June 2013 to February 2016.

Results: In-labour referrals constituted the majority of emergency obstetric referrals. Preterm obstetric referrals needed emergency interventions in view of medical/obstetric indications and it was statistically significant. Referral-decision and referral-arrival interval was significant in emergency group (p-value-0.001). Babies born to mothers who were obstetric emergency referrals had extended NICU stay (p-value-0.001). There was a maternal death and four near-misses in this research.

Conclusions: Timely decisions taken during interhospital emergency referrals resulted in better perinatal outcomes by prompt maternal interventions.

Keywords: Emergency, Foetal, Maternal, Morbidity, Obstetric, Perinatal, Referrals

INTRODUCTION

In health care delivery systems, referral is a set of activities undertaken by a health care provider or facility in response to its inability to provide the quality or type of intervention suitable to the need of the patient. To be effective, referral should be a two-way process that requires coordination and information exchange between the referring facility (usually at the primary care level) and the first referral hospital. The process of implementation of referral systems must be seen against the background in Kerala of relatively high health status indicators, uneven achievements across districts and between districts, less differences between urban and

rural areas and between the rich and the poor. The presence or absence of referral systems and the degree to which they are effective are among the indicators of access to care as well as quality. Ensuring access in appropriate matter is the concern of equity health care delivery. Referrals should be made to the nearest appropriate and affordable health facility which should as far as possible be free in cases of emergency.¹⁻⁴

Access to appropriate health care including skilled birth attendance at delivery and timely referrals to avail emergency obstetric services can greatly reduce maternal deaths as well as disabilities. Timely access to emergency care is therefore seen as an indicator of a successful

health system. The inability of most women to access timely emergency obstetric care (EMOC) remains one major challenge in addressing the burden of maternal mortality worldwide.⁵⁻⁷

An obstetric emergency is defined as an obstetric complication or situation of serious and often dangerous nature, developing suddenly and unexpectedly and demanding immediate attention in order to save life. Referral institutes/tertiary care facilities should be equipped to receive such referrals. In the case of maternal and neonatal care this includes facilities capable of providing basic emergency obstetric care (BEOC) and comprehensive emergency obstetric care (CEOOC). Health professionals should be available to provide care in hospitals once referrals are made.

India has a maternal mortality ratio (MMR) of 162 deaths per 100,000 live births and accounts for 17% of global maternal deaths.⁸ Kerala is a high-performing Indian state with regards to health indicators, with an MMR of 31 per 100,000, an institutional delivery rate of 99% and almost universal antenatal care. Kerala has a 94% literacy rate and over 90% of houses having electricity and a toilet facility.⁹ In order for referral systems to function effectively the lower levels must be operated by appropriately skilled personnel who have the necessary infrastructure. This ensures that there is delivery of the range of services required and unnecessary referral is avoided. Self-referral to higher levels or skipping of one step overburdens secondary and tertiary care facilities where unit costs are higher, underutilizes health centres and other primary care facilities and increases out-of-pocket payments to the majority of general fee-paying patients. Referrals are expected to take place from first stratum to the second and third stratum with a corresponding decrease in the quantity of referrals going to the higher levels. The referral documents from the health centre should have minimum amount of information when patients are referred to the hospital. The lack of a referral letter or a poor quality referral letter can compromise management of a patient.¹⁰ Community awareness needs to be created regarding availability of health care facility during their antenatal care and discourage self-referrals due to “want of good care,” “for normal delivery” or “perceived risk.” Further, feedback from the receiving facility to the initiating facility will enable health system strengthening and improve health care delivery.

In this study, authors have analysed emergency obstetric referrals - their sources of referral, reasons necessitating urgent referral, in-labour referral, distance travelled to receive comprehensive emergency obstetric care, birth weight and gestational age at which referral was done and GA of decision, mean NICU stay and morbidities in the mother.

The main aim and objective of this study is to analyse emergency obstetric referrals-their sources of referral,

reasons necessitating urgent referral, in-labour referral, distance travelled to receive comprehensive emergency obstetric care, birth weight and gestational age at which referral was done and GA of decision, mean NICU stay and morbidities in the mother.

METHODS

An observational study conducted at Travancore Medical College, Kollam, a tertiary care teaching institution which receives inter-hospital transfers from Primary health centres (PHC), Community health centres and private hospitals in and around Kollam. The sample population consisted of 124 obstetric referrals of 24 weeks and beyond during June 2013 to February 2016. All booked cases and obstetric referrals of less than 24 weeks and 6 out referrals were excluded from the study. Emergency obstetric referrals were 90 and electives were 34. Study protocol was approved by the ethics committee. Using a pre-structured designed questionnaire, socio demographic details, medical co-morbidities, indications for emergency referral- maternal and foetal were obtained. Referral slips were analysed and source of referral, referral-arrival interval, documentation patterns were sought. Patient referred while in labour were specially noted. Gestational age at referral and at decision/intervention was highlighted. Neonatal weight, NICU stay in days and morbidity looked into.

Statistical analysis

Data was analysed for descriptive statistics such as mean, standard deviation and percentages were computed using SPSS for Windows version 20. p value <0.05 was considered significant.

RESULTS

The study population comprised 124 obstetric referrals which included 90 emergency and 34 elective referrals. The socio-demographic data, maternal age, domicile, maternal education and employment during pregnancy were studied and was comparable in both the groups. Mean maternal age was 27.06 in Emergency referral group. Among 16.9% of government referrals, 15 were from district hospital and were either in labour or required emergency obstetric care or level III. Sources of referral contributed equally in both emergency and elective obstetric referrals.

Emergency obstetric referrals had to be decided for operative delivery due to multiple reasons.

Emergency group had statistically significant in -labour referrals (p value-0.04).

All the obstetric referrals from public health sector reached within half an hour while one third of private sector referrals travelled more than an hour for emergency obstetric care (p value 0.001).

Table 1: Referral characteristics-gestational age at referral and in-labour.

GA at obstetric referral	Emergency	Elective	Odds ratio	p value
24-27.6	7 (7.8%)	2 (5.9%)	0.867	0.848
28-32.6	27 (30.0%)	13 (38.2%)		
33-36.6	44 (48.9%)	15 (44.1%)		
37-40	12 (13.3%)	4 (11.8%)		
Total	90	34		
Whether referral was in-labour	Emergency	Elective	p value	
Yes	58 (64.4%)	2 (5.9%)	0.001	
No	32 (35.6%)	32 (94.1%)		
Total	90	34		
GA at decision	Emergency	Elective	Odds ratio	p value/odds ratio
24-27.6	7 (7.8%)	1 (2.9%)	4.550	0.007
28-32.6	27 (30.0%)	6 (17.6%)		
33-36.6	44 (48.9%)	13 (38.2%)		
37-40	12 (13.3%)	14 (41.2%)		
Total	90	34		

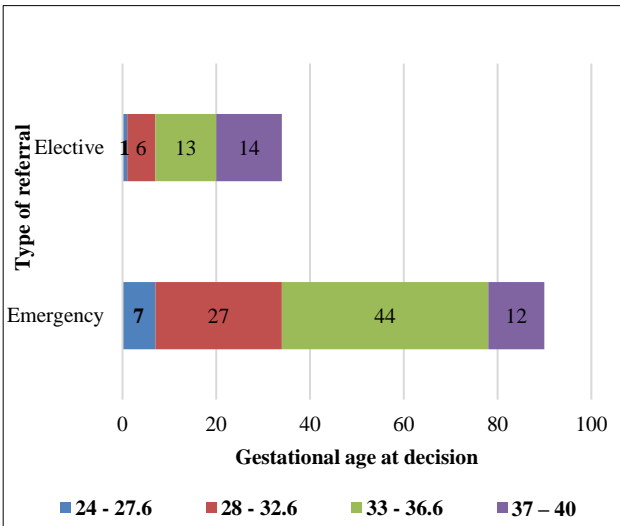


Figure 1: Decision of obstetric referrals.

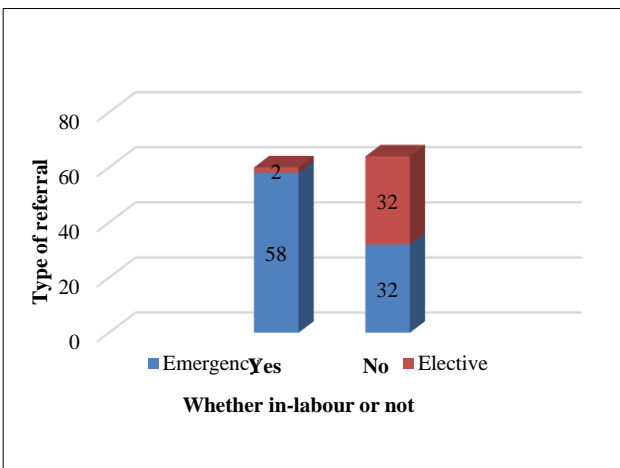


Figure 2: Labour referrals-emergency obstetric care.

Table 2: Source of referral.

Referral place	Emergency	Elective	p value
Government hospital	15 (16.7%)	6 (17.6%)	0.897
Private hospital	75 (83.3%)	28 (82.4%)	
Total	90	34	
If government hospital (n=21)	Emergency	Elective	p value
CHC	0 (0.0%)	2 (33.3%)	0.026
District hospital	13 (86.7%)	2 (33.3%)	
ESI	0 (0.0%)	1 (16.7%)	
PHC	2 (13.3%)	1 (16.7%)	
Total	15	6	
Referral-arrival time			p value
Within half an hour	86 (95.5)	6 (17.64)	0.001
>Half an hour	4 (4.5)	28 (82.36)	
Total	90	34	

Table 3: Document handed over to the in-referral centre.

Referral letter	Emergency N=90	Elective N=34
Structured	70	19
Unstructured	18	14
No Document available	2	1
	90	34
Medical, obstetric details, scan	Emergency N=90	Elective N=34
Available	72	11
Not available	18	23

Documentation details between emergency and elective obstetric referrals.

Maternal reasons predominated public sector referrals while foetal causes dominated private referrals (p value - 0.05). Many patients had multiple complications at the time of referral and had to be delivered early.

Table 4: Reasons for referral-emergency.

Reasons for referral	Total N=124	Emergency N=90	Elective N=34
Maternal			
Previous caesarean in labour	11	10	1
Preterm labour	13	10	3
Severe pre-eclampsia	10	8	2
Multifetal gestation	13	11	2
APH-abruptio /praevia	8	2	6
Malpresentation	4	1	3
CPD/failed induction	4	2	2
PPROM	14	12	2
Foetal			
FGR-oligoamines	14	11	3
Doppler abnormality-FGR	10	10	0
Intra-uterine demise	6	1	5
Foetal distress NRFHR	9	7	2
Others [#]	8	5	3
p-value-0.05			

#Others include Rh negative, short primigravida and a case of facial nerve palsy-acute episode in elective referrals, 2 cases of dengue fever, 2 cases of Chicken pox, 1 case of HBsAg positive in the emergency referrals.

There were significantly more babies born preterm in emergency obstetric referrals (<36.6 weeks).

Table 5: Referral outcomes-viability.

Foetal outcome	Frequency	Emergency	Elective
Term	37	22	15
Preterm	98	77	21
IUD	6	1	5
Total	141	100	41

Details of singleton and multifetal gestation. Table showing varying birth weights in obstetric referrals.

More babies were born preterm in emergency obstetric referrals (<36.6 weeks) resulting in more babies needing extended NICU care as they were either growth restricted

or twin/triplets/being extreme prematurity (p value-0.001).

Table 6: Referral outcome-singleton versus multifetal.

Variables	Number	Emergency	Elective
Total number of babies	141	105	36
Twin gestation	9×2 = 18	16	2
Triplet gestation	4×3 = 12	9	3
Singleton	105	79	26
Intrauterine - foetal demise (IUID)	6	1	5

Table 7: Birthweights of babies of obstetric referrals-survivors versus non-survivors.

Birth weight in kgs	Frequency	IUID/NND	Emergency alive	Elective alive
<1.000 kg	17	12	4	1
1.000-1.499 kg	31	3	25	3
1.500-1.999 kg	35	3	27	5
2.000-2.499 kg	26	1	19	6
2.500-2.999 kg	16	1	6	9
3.000-3.499 kg	14	1	7	6
>3.500 kg	2	0	1	1
Total	141	21	89	31

Table 8: Birthweights of babies of obstetric referrals-LBW versus normal.

Variable-foetal	Emergency	Elective	Odds ratio	p-value
Weight of new-born				
<2.499 kg	74 (80.4%)	18 (19.6%)	4.111	0.001
>2.5 kg	16 (50.0%)	16 (50.0%)		

Table 9: Neonatal ICU characteristics.

NICU	Emergency	Elective	p-value
Yes	73 (81.1%)	16 (47.1%)	0.001
No	17 (18.9%)	18 (52.9%)	
Total	90 (100%)	34 (100%)	
Days in NICU (n=96)			
<2 days	10 (13.7%)	6 (37.5%)	0.033
3 - 6 days	21 (28.8%)	1 (6.3%)	
>6 days	42 (57.5%)	9 (56.3%)	
Total	73 (100%)	16 (100%)	
NICU			
Ventilator	51 (69.9%)	11 (68.8%)	0.674
CPAP	13 (17.8%)	4 (25.0%)	
Phototherapy	9 (12.3%)	1 (6.3%)	
Total	73 (100%)	16 (100%)	

Table 10: Maternal characteristics.

Maternal stay	Total	Emergency	Elective	p-value
<6 days	74	54 (60.7%)	20 (58.8%)	0.851
>7 days	49	35 (39.3%)	14 (41.2%)	

As the elective referral babies were near term and hence had shorter NICU stay (<6 days) making p-value statistically significant. Mean maternal hospital stay was similar in both the groups.

There were only 14 antenatal referrals which had to wait for elective decisions later. Remaining referrals were on time, prompt and hence averted maternal morbidity and mortality.

Table 11: Referral-decision gestational age.

GA at referral (in weeks)	GA at decision(in weeks)				Fisher's exact test value	p-value
	24-27.6	28-32.6	33-36.6	37-40		
24-27.6	8	-	-	1	186.145	0.001
28-32.6	-	33	4	3		
33-36.6	-	-	53	6		
37-40	-	-	-	16		
Total	8	33	57	26		

p-value calculated by fisher's exact test, p <0.05 considered as significant

DISCUSSION

In this descriptive study there were 1600 deliveries which constituted 131 in-referrals and 7 out- referrals which in this study was 8% similar to 9.4% in Chaturvedi.¹¹ 73.4% were in the age group of 20-30 years as in a similar research.¹² Public sector had statistically significant in-labour referrals (p value-0.04) in contrast to inter-hospital transfers in Brunei where antenatal referrals constituted the majority.¹³ All the obstetric referrals from public health sector reached within half an hour while one third of private sector referrals travelled more than an hour for emergency obstetric care (p-value 0.001) similar to Brunei study but in contrast to Sheik et al.¹⁴ The high proportion of referrals and the experience faced during the same are probably a reason why pregnant women in India chose to deliver at private institutions to avoid transfers.¹⁵

Maternal

In this study, the most common reason for referrals was obstetric indications. Pre-eclampsia, preterm labour, need for NICU care, multifetal gestation, previous caesarean and foetal causes like foetal growth restriction (FGR) with worsening doppler parameters were the most commonly reported causes. Pre-eclampsia was detected in 11% and severe anaemia in 8% of all pregnant women in the study by Alehgen.¹⁶ Pre-eclampsia and eclampsia are among the top three causes of maternal mortality in India.¹⁷ As per the World Health Organization, India tops the list of 10 nations contributing 60 percent of the World's premature deliveries. The presence of high-risk maternal and neonatal factors generates referrals of such

cases to higher-level facilities for labour management. Incorporation of cost-effective strategies such as timely administration of corticosteroids and emergency neonatal care at secondary-level facilities should be considered for management of premature babies. In the present study, asthma was a significant morbidity among emergency public sector obstetric referrals (p-value-0.001) as in a similar research.¹⁵ A study conducted in Tanzania reported that among 28% of referred patients, 70% were referred due to demographic risks, 12% due to obstetric historical risks, 12% prenatal and 5.5% intrapartum and postpartum risks.¹⁸ Jahn and De Brouwere identified a core set of indications for referral which would produce referral rates of 6% to 10% and reduce a lot of unnecessary high-risk referrals mainly previous caesarean section (obstetric historical risk), breech presentation, transverse lie, multiple gestation, hypertension, and severe anaemia.¹⁹ Emergency maternal referrals included previous caesarean in labour, preterm labour, severe preeclampsia, multi-foetal gestation. 27.6% referrals were for hypertensive disorders and 34.5% were for preterm labour in the study by Agarwal et al.²⁰ There were 2 chronic HBV infections similar to Agarwal et al. Infections included 4 dengue fever cases, 2 cases of Chickenpox in labour in emergency referrals. Immediate intervention was needed for severe pre-eclampsia, eclampsia, previous caesarean in labour, antepartum haemorrhage preterm labour and higher order pregnancies remote from term. Agarwal et al, reported 16 patients with eclampsia, a major preventable cause of maternal mortality. Most of the patients 56% (42% in private hospitals and 14% in public) referred for better neonatal care either due to anticipated preterm birth, foetal growth restriction, oligohydramnios, foetal distress, doppler abnormality had to be managed with

emergency caesarean delivery. Emergency in-referrals in Rajasthan had reasons such as obstructed labour (25%), antepartum haemorrhage (16%), pregnancy induced hypertension (16%), severe anaemia (14%), complicated abortion (12%), post-partum haemorrhage (6%) and twin pregnancy (6%).²¹

Authors had seven out-referrals (5.6%), two cases of complete placenta previa from public sector and five cases from private sector. (Scrub typhus, swine flu, autoimmune thrombocytopenia, hepatitis A, PPROM) Chaturvedi reported that 5.9% women seeking delivery care were referred out.¹¹ The out-referral rate was highest from PHCs (14%) followed by CHCs (8%) and tertiary hospitals (1%). Half of the referrals from PHC were directly to tertiary hospitals, bypassing the CHCs. There were 11% “near-miss” cases in Kaul et al and 4 near-miss” (3.22%) referrals from our private sector needing multidisciplinary care.²²

Kirti et al in a similar study had 34% referrals from state general hospitals and 27% rural hospitals while 9% were only from private hospitals.²³ Cases were similar in distribution from both private and public sector in both emergency and elective groups. There were significantly more babies born preterm in emergency obstetric referrals (<36.6 weeks) resulting in more babies needing extended NICU care as they were growth restricted/twin or triplets/being extreme premature (p value-0.001).

Morbidity

There were 4 near misses which were due to severe pre-eclampsia and HELLP syndrome. Ten cases needed blood transfusion. 12 cases were given Mag-sulphate regime for impending eclampsia/eclampsia/severe preeclampsia. There were 2 cases of posterior reversible encephalopathy syndrome. All the 7 mothers who needed ventilator support not related to anesthesia were emergency obstetric referrals. A maternal death in a G5 P2 L2 A2, previous caesarean, pre-GDM and hypertensive presented with rupture uterus in shock reached in half an hour. Caesarean hysterectomy was done and five units of Packed RBCs were transfused and maternal death could not be averted. Mean maternal hospital stay was similar in both the groups.

Foetal

Out of 141 babies, there were 120 survivors. NICU admissions were statistically significant in emergency referrals (p-value 0.001) due to preterm referrals and very low-birth weight babies. As the elective referral babies were near term and had shorter NICU stay (<6 days), p-value was statistically significant. Mean hospital stay in private sector was 10.17 days while it was only 7.62 days in government referrals. Survival rate of babies in this study was 84.5% due to the state-of-the-art neonatal care facilities. 77.3% were low birth weight babies of less than 2500 g in contrast to 56% LBW babies in Rathi et al.²⁴

A total 21 neonates succumbed to prematurity, respiratory distress, hypoxic ischemic encephalopathy and sepsis. The perinatal mortality rate is 14.63. There were 11 neonatal deaths in babies of multifetal gestation. In a similar study 25, total number of live births were 73 (78.5%) among which 28 (30%) required neonatal admission and 5 (5.3%) had early neonatal death.

Strengths

This study provides valid information on the different variables of referral in obstetric emergencies to a tertiary health facility in the state of Kerala, where there is little research conducted on the referral process and other possible challenges encountered in receiving antenatal care at these facilities.

The limitation of this study was, this study only focused on the receiver end of the referral system and to have a comprehensive view of the challenges of the entire system it will be prudent to involve research on the sending facilities.

CONCLUSION

Maternal mortality can be averted by having maternal near -misses in developing countries by effective referral systems. Specific guidelines for “whom to refer”, “how to refer” “when to refer” and “where to refer” would be helpful in making timely referral. Initiatives to improve timely transportation system for obstetric emergencies are vital in ensuring patients’ safety and continuity of care during transfer. Communication between referring and receiving facilities should be enhanced and feedback should be entertained. Ensuring an effective referral system will thus need a strong collaboration and coordination among the various levels of care. Strengthening the referral systems can play a critical role in timely management of high-risk obstetric cases and eventually improve maternal and neonatal outcome.

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