

Original Research Article

Analysing maternal determinants and characteristics of obstetric referrals at a tertiary care centre in Kerala, India

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ABSTRACT

Background: Timely and prompt referral of high risk pregnancies is an integral part of emergency obstetric care and is one of the effective strategies to avoid adverse pregnancy outcomes. This study aims to assess the maternal determinants and characteristics of obstetric referrals to Travancore Medical College and Hospital.

Methods: This observational study reviewed 124 obstetric referrals over 3 years. Maternal risk factors and sources of referral were looked into. Distance travelled, referral-arrival interval, mode of transport, gestational age at referral, medical co-morbidities necessitating emergency/elective transfers to this tertiary centre have been analysed.

Results: Referral rate was 7.03%. Mean age was 26. Primipara and multipara went hand in hand. 95% were graduates. Materno-fetal (58%) contributed the bulk of obstetric referrals. 83.1% were from private hospitals and 64 were in-labour referrals. 71.6% had referral arrival distance of <15 kms. Mode of transport used by the referred patients was by ambulances (73.9%). Around 48% of our population had GA of 33-36.6 weeks. 73% had emergency decision among which caesarean was 83%. Anaemia (34%), HDP (30.5%), GDM (14.2%) and hypothyroidism (17.7%) were medical co-morbidities necessitating referrals. There was 1 maternal death and 4 near miss mortality cases. Mean hospital stay in private sector referrals was 10.17 days and it was 7.62 days in government referrals.

Conclusions: Timely referrals with detailed referral slips imparting information regarding treatment received at the referring hospital has helped in early and optimal intervention in the study.

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

INTRODUCTION

Emergency obstetric transfers should be carried out effectively and efficiently to avoid maternal and foetal morbidity and mortality. An institution referral is when a pregnant woman seeks care at a lower level health facility (basic emergency obstetric care) and is referred onwards to a higher level health facility (comprehensive emergency obstetric care). "Referral systems" have been considered to be an important component of health

systems in developing countries since the emergence of primary healthcare. Referral is especially important within obstetrics due to the high numbers of professionals who support a woman through pregnancy and birth, the speed with which action often needs to be taken and the global burden of maternal mortality.¹ The World Health Organization estimates that at least 88–98% of maternal deaths can be averted with timely access to existing, emergency obstetric care using effective and efficient referral systems. A good and well sustained referral system needs referral- protocols, improved support

(especially transportation), community awareness, and feedback system.²

India has a national public health sector which provides free care, and a prominent private sector which charges for services and is largely unregulated. India has a maternal mortality ratio (MMR) of 162 deaths per 100,000 live births and accounts for 17% of global maternal deaths.³ 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 (ANC). Kerala has a 94% literacy rate and over 90% of houses having electricity and a toilet facility.⁴ Even though state of Kerala has state of art health care, limited studies have been conducted to analyse determinants of referrals and characteristics of referral in obstetric care.

In this study, we have analysed maternal determinants of referral, Gestational age and in-labour referrals, referral characteristics (source of referral, referral-arrival interval, transport systems, distance travelled to receive comprehensive emergency obstetric care, referral documentation), mode of delivery, mean maternal hospital stay and morbidities in the mother.

Aims and objectives

The main aim and objective of this study is to analyse the maternal determinants of obstetric referrals-maternal age, parity, income, education, employment during pregnancy and medical disorders necessitating inter-hospital transfers, to look into the referral characteristics-source of referral, distance travelled and mode of transport and referral-arrival interval and to know the gestational age at referral and delivery outcomes, morbidity and hospital stay.

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. Study protocol was approved by the ethical committee. Using a pre structured designed questionnaire, socio demographic details, medical co-morbidities, indications for referral-maternal and foetal were obtained. Referral slips were analysed and source of referral, distance travelled and mode of transport and referral-arrival interval, documentation patterns were sought. Patient referred while in labour were noted. Gestational age at referral and mode of delivery was highlighted. Intra partum variables and surgical morbidities were evaluated. Need for ventilation and multi-disciplinary team work, mean

hospital stay was looked into. 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 significant.

RESULTS

The study population comprised 124 obstetric referrals which included 21 public sector and 103 private sector referrals. The socio-demographic data, maternal age, domicile, maternal education and employment during pregnancy were noted.

Table 1: Socio-demographic profile of obstetric referrals (n=124).

Variable	N	%
Maternal age (years)		
<20	8	6.5
20-30	91	73.4
>30	25	20.2
Parity		
Nulli	60	49.2
Multi	64	50.8
Education		
Primary	1	0.8
Secondary	6	4.8
Graduate	117	94.4
Domicile		
Rural	102	82.3
Urban	22	17.7
Type of family		
Nuclear	7	5.6
E. nuclear	85	68.5
Joint	32	25.8
Treated for infertility		
Yes	20	14.2
No	104	73.8

Private sector referrals comprised the bulk (83.1%). Among 16.9 % of government referrals, 15 were from District hospital and were either in labour or required Emergency Obstetric Care or Level III.

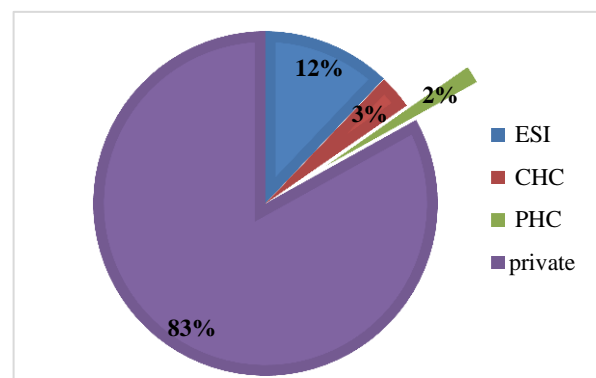


Figure 1: Source of obstetric referrals.

Public sector 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).

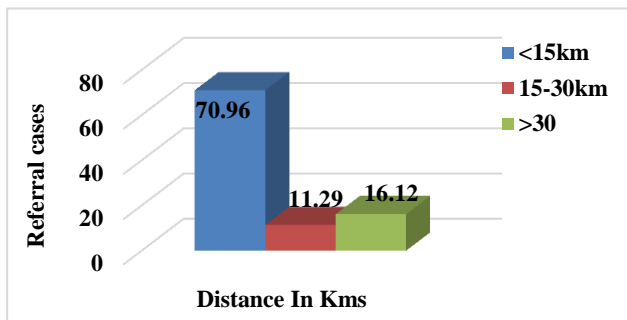


Figure 2: Distance travelled for care from hospital of referral.

58% travelled in ambulance provided by the referring hospital while 24% had to hire a private vehicle for inter-hospital transfer. 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).

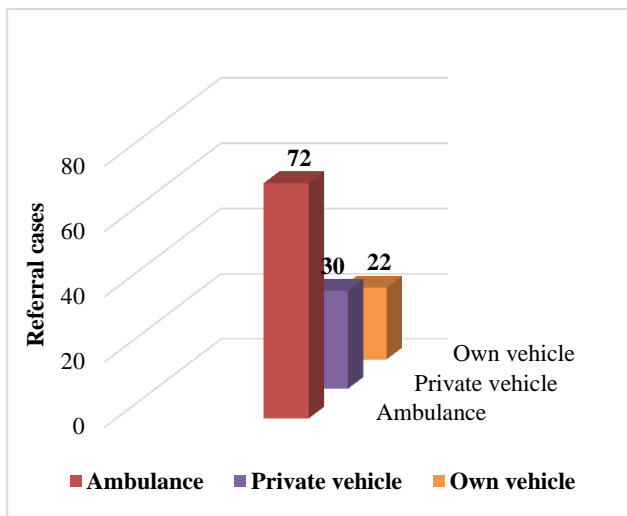


Figure 3: Mode of transportation of referrals.

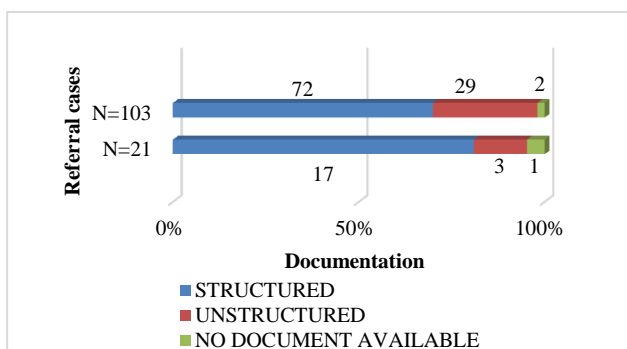


Figure 4: Documentation in obstetric referrals.

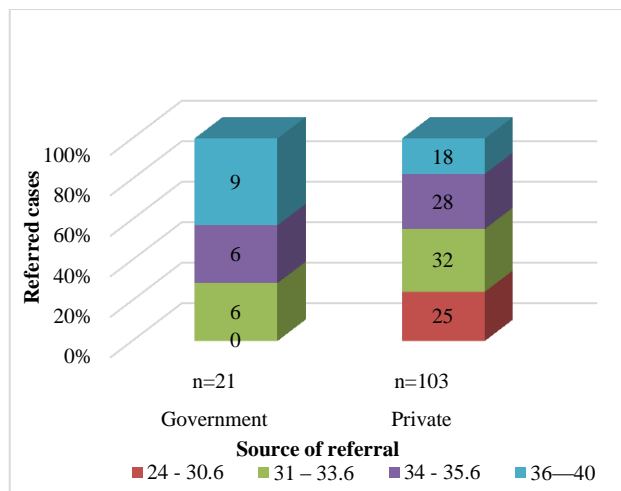


Figure 5: Gestational age at referral.

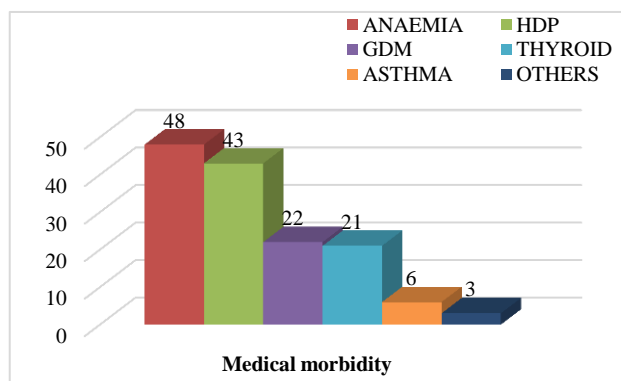


Figure 6: Medical conditions associated with referral.

Table 2: The reasons for obstetric referrals.

Reasons for referral	Public (n=21)	Private (n=103)
Maternal (76%)		(58%)
Previous caesarean in labour	03	08
Preterm labour	03	10
Severe pre-eclampsia	02	08
eclampsia		
Multifetal gestation	02	11
Abruption/praevia	02	06
Malpresentation	02	02
CPD or failed induction	01	03
PPROM	02	12
Fetal (14%)		(42%)
FGR-oligamnios	01	13
Doppler abnormality	-	10
Intra-uterine demise	01	05
Fetal distress NRFHR	01	08
Others	01	07
	P value=0.05	

In our study, 70% of private sector referrals had structured letters and 28% had unstructured ones and 2%

had no document available at referral while documentation was slightly better in the public sector.

There were no referrals from public sector <31 weeks while 55% were referred <31 weeks from private hospitals for neonatal care with significant p value (p=0.016).

Asthma was significant morbidity for public sector referrals (p value=0.001).

Many patients had multiple complications at the time of referral and the main reason was chosen as the reason for obstetric referral. Maternal reasons pre-dominated public sector referrals while foetal causes dominated private referrals (p value=0.05).

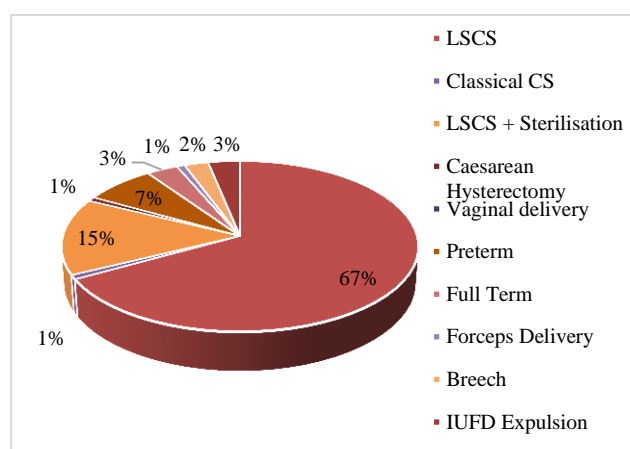


Figure 7: Mode of delivery among obstetric referrals.

Caesarean section accounted for 83% of referrals. Previous caesareans (obstetric historical risk) and high risk obstetric referrals accounted for the bulk.

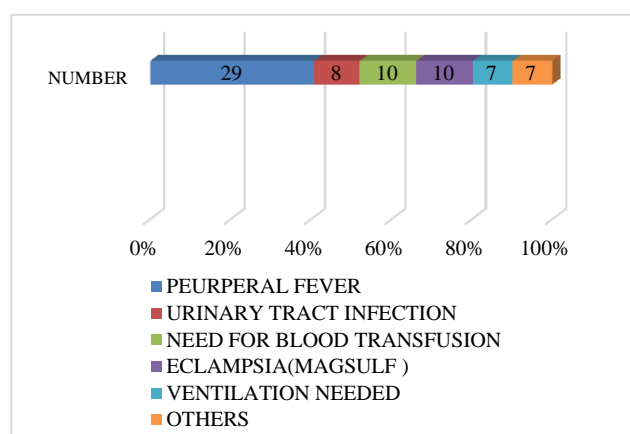


Figure 8: Postoperative maternal morbidities in referrals.

Ten cases needed blood transfusion. 12 cases were given magnesium 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 referred from the private sector.

DISCUSSION

Referral rate and maternal demographics

Referral rate was 7.03% in this research. Alka et al in their similar study noted 24.16% of cases were referred.⁵ The proportion of referred cases at Gwalior was 20.86%.⁶

Maternal age

Banu et al on assessing the overall age distribution found that majority (74%) of the respondents were between 20-35 years.⁷ In the present study, the maximum number of patients were in the 20-30 years of age group as 73.4% similar to 78% in Gwalior.⁶

Parity

Gupta et al found 52.17% patients were primigravida, which is comparable to 47% primigravida cases found in Gwalior while our population was nearly equally distributed in both primigravida and multigravida as in study by Bindal.^{6,8-9} We had nearly equal numbers of obstetric referrals both antepartum and intrapartum while 56%, 30% and 14% of referrals were in their intrapartum, antepartum and postpartum period respectively in a similar referral study in Gwalior. Similar results were found by Devineni et al in their “study of spectrum of referral pattern at a tertiary teaching hospital towards better obstetric care”.¹⁰

Domicile

There were 82.3% were from the rural area, also in Vinayak et al and Wahane et al reported 77%.¹¹⁻¹² This high proportion of rural population may be due to delay in access to health care and lack of awareness and poor transport facilities. Infertility treated obstetric referrals were at significant risk of referral (p value=0.002).

Education

Kerala has a 94% literacy rate and as evidenced by 94.4% graduates in this population.

Referral characteristics

Source of obstetric referral

Private sector referrals comprised the bulk (83.1%). Among 16.9% of government referrals, 15 were from District hospital and were either in labour or required Emergency Obstetric Care or Level III. 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.¹³ Neonatal care, 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.¹⁴

Distance travelled to referral centre

Chandrayan et al observed that 70% cases travelled more than 50 km distance before reaching to hospital and had increased incidence of intra operative complications and haemorrhage.¹⁵ 70.96% of our obstetric referrals travelled less than 15 kms for comprehensive emergency obstetric care while 16.12% travelled more than half an hour to receive the same. 64.75% cases in Gwalior⁶ were referred from within 50 km distance, 23.4% cases travelled 50-150 km distance before reaching the hospital and 11.85% case travelled for more than 150km.

Mode of transportation to referral centre

58% travelled in ambulance provided by the referring hospital while 24% had to hire a private vehicle for inter-hospital transfer. In a study conducted by Vinayak et al, only 11% patients travelled by ambulance.¹¹ Only 38% referrals travelled in ambulance while 62% patients used their private vehicles in Gwalior study.⁶ 58% travelled in ambulance provided by the referring hospital while 24% had to hire a private vehicle for inter-hospital transfer. Arranging a private vehicle when faced with obstetric emergency necessitating referral takes time and costs money. 17% reached in their own transport mode to our referral centre.

Referral-arrival interval

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).

Documentation slip to the referral centre

In our study, 70% of private sector referrals had structured letters and 28% had unstructured ones and 2% had no document available at referral while documentation was slightly better in the public sector. Ohn et al had 19.4% referrals with no referral slips.¹⁶ In Chaturvedi et al study and Madhya Pradesh study, 72% in-referred cases had a referral slip however they mostly did not contain the reasons for referral and the treatment provided before referral.^{17,18}

Gestational age at referral

There were no referrals from public sector <31 weeks while 55% were referred <31 weeks from private hospitals for neonatal care with significant p value (0.016).

Why was the obstetric referral done and what was the mode of delivery?

Maternal 62% and foetal 38% were major reasons for obstetric referrals. Common causes of maternal referrals include previous caesarean in labour, preterm labour, severe preeclampsia, multi foetal gestation while preterm premature rupture of membranes, fetal growth restriction (FGR), oligamnios, abnormal doppler were the common foetal causes. Fortunately most asthma attacks were mild but could have been serious and received care here. 27.6% were hypertensive disorders and 34.5% were in preterm labour in Agarwal et al. There were 2 HBSAg +ve obstetric referrals in the present study as is with Agarwal et al.¹² There were multiple reasons necessitating obstetric referral in our study. Multifetal gestation in a first time mother who was gestational diabetes mellitus (GDM) on insulin, had polyhydramnios and preterm premature rupture of the membranes (PPROM) at 32 weeks of pregnancy needed emergency caesarean. Four mothers with impending eclampsia, Doppler abnormality with FGR were given magnesium sulphate regimen landed in emergency preterm caesarean. Emergency intervention were done for previous caesarean in labour, antepartum haemorrhage, preterm labour and higher order pregnancies remote from term (IVF pregnancy). According to Agarwal et al patients came with eclampsia that is a major preventable cause of maternal mortality.^{12,16} Elderly Primi, treated for infertility, came with features of intestinal obstruction due to endometriotic band at 34 weeks underwent emergency classical caesarean. 64.5% of our obstetric referrals received antenatal corticosteroid before emergency decision. In this study, previous caesareans (obstetric historical risk) and high risk obstetric referrals resulted in caesarean delivery in 81% which was 61% and 43.5%.^{19,20} Intra- uterine foetal demise also resulted in 7% of our referrals.

Medical factors necessitating obstetric referral

Patel HC et al, in their study found that causes of referral were preeclampsia (16%).²¹ In present study, however, anaemia followed by hypertensive disorders of pregnancy were the major causes of referral to the tertiary care hospital. Multiple co-morbidities were present in 12% of our obstetric referrals. 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%).²²

Morbidities and the course in the hospital

Shorter ICU stay was noted in 80% of private sector patients compared to 18% of Government referrals. Extended hospital stay was noted in 10 obstetric referrals. Mean hospital stay in private sector referrals was 10.17

days and 7.62 days in government referrals in the study. Goswami et al reported 8.02% needed obstetric ICU admissions.⁹ Shelat et al in their study concluded that emergency obstetric referrals were exposed to highest risk of maternal complications.²³

CONCLUSION

Timely referrals with detailed referral slips imparting information regarding treatment received at the referring hospital has helped in early and optimal decisions and averted maternal near-misses in the study. Adhering to referral protocols during interhospital referrals in Kerala and prompt documentation of the referral characteristics will go a long way to keep a track of these in the near future and thereby preventing maternal morbidity and mortality.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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