



OUTCOME OF OBSTETRICS REFERRALS TO A TERTIARY REFERRAL HOSPITAL IN CHHATTISGARH

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ABSTRACT **Background** - World Health Organization reports that about 800 women die from pregnancy- or childbirth-related complications around the world every day. Timely referral on one hand can save maternal and neonatal morbidities and mortalities but on other hand too many referrals or unwanted referrals may lead to exhaustion of resources of tertiary care centre. With this background, present study was undertaken to evaluate the pattern of obstetric cases and maternal outcome among referred patients. **Material and method** - The present study was a 7 month prospective observational study conducted in Department of Obstetrics and Gynaecology, Pt. J.N.M. MEDICAL COLLEGE, RAIPUR on 2903 referred intrapartum and postpartum subjects during study period to study referrals with respect to demographic factors, time and place of referral, transport used, cause of referral, maternal and perinatal outcome and finally maternal deaths and their causes. **Results** - Obstetric referrals accounted for 42.42% (2903/6843) of the total admissions. Maximum number of patients were referred from CHC (50.91%) followed by Sub centre and PHC (24.11%). The majority or 97.10% (2819) were intrapartum admissions and 2.9% (84) were postpartum admissions. Most common diagnosis at referral was previous caesarean sections in labour. However, most common diagnosis on admission were labour pain (16.67%) followed by caesarean sections in labour (15.12%). The outcome of the referred cases included: 1597 (56.69%) vaginal delivery, 1212 (43.02%) caesarean section, 08 (0.28%) underwent laparotomy for rupture uterus. There were 25 maternal deaths among the referrals with obstetric haemorrhage being the leading cause of death in 10 subjects. **Conclusion** - Study concluded that this tertiary center receives significant number of referral patients of which majority did not needed any sophisticated equipment or personnel to manage. Even today, obstetric haemorrhage is the leading cause of maternal mortality. The reliance of referrals to tertiary centers for emergency obstetric care should be shifted to improving the functionality of the referring centers.

KEYWORDS :

INTRODUCTION

The World Health Organization reports that about 800 women die from pregnancy- or childbirth-related complications around the world every day (1). From 2000 to 2020, the global maternal mortality ratio (MMR) declined by 34 per cent, from 342 deaths to 223 deaths per 100,000 live births, according to UN inter-agency estimates (2). Current Maternal mortality ratio of India is 97 per lakh live births as per the statistics derived from Sample Registration System (2018-2020) (3). Historical evidence at the global level has demonstrated that it is possible to bring down maternal mortality effectively if a package of obstetric services is provided within reach of the communities and the families. Sustainable Development Goal (SDG) target 3.1 is to reduce maternal mortality to less than 70 maternal deaths per 100 000 live births by 2030 (4).

A functioning referral system is generally considered to be a necessary element of successful Safe Motherhood programmes. Main objective of referral processes is to provide required level of treatment facilities to patients who require treatment that are not within the scope of services of hospital and the referral is made to other hospital. Referrals can lead to favourable outcomes. Timeliness and appropriateness of referral is an important factor in the ultimate outcome of the patients (5).

Timely referral on one hand can save maternal and neonatal morbidities and mortalities but on other hand too many referrals or unwanted referrals may lead to exhaustion of resources of tertiary care centre. Tertiary care centre are meant to provide expertise of the knowledge and skill to deal with all the complications of the cases. If tertiary care centre are flooded with low risk cases then high risk cases will not get required time and resources for their management. With this background, present study was undertaken to evaluate the pattern of obstetric cases referred and profile of emergency obstetric referrals and maternal outcome amongst referred patients to the Department of Obstetrics and Gynaecology, PT.JNM MEDICAL COLLEGE, Raipur, a tertiary care teaching hospital which caters nearly 11,000 obstetric patients every year with 9000 deliveries conducted annually.

MATERIALS AND METHODS

The present study was a 7 month prospective observational study

conducted in Department of Obstetrics and Gynaecology, Pt. J.N.M. MEDICAL COLLEGE, RAIPUR from June 2023 to December 2023 on 2903 intrapartum and postpartum referred subjects with the primary objective to study maternal outcome and secondary objective to study the demographic profile, referral details, clinical course, mode of delivery and maternal morbidity and maternal mortality.

SELECTION OF PATIENTS -

INCLUSION CRITERIA - Referred women in intrapartum and postpartum period to this tertiary care institute from government health institute.

EXCLUSION CRITERIA -

1. All registered antenatal cases in this institute.
2. Patients with preterm labour pain who were conservatively managed.

METHODS -

All Parturients referred to this institute by Government health institute during intrapartum and postpartum period from July 2023 to December 2023 were registered for study after taking informed consent. Detailed information of patients and of referrals were noted - Type of referral centre, reason of referral, cadre incharge of referral, any prior communication before referral, Means of transport, Accompanying health personnel, Timing of referrals, Referral time to arrival time interval. Detailed history was taken and relevant investigations were done.

All the cases were closely watched during labour progress and mode of delivery and any requirement of obstetric intervention was noted. Maternal outcome in the form of maternal morbidity and mortality was noted. Particulars of newborn baby whether live or dead, shifted to NICU or mothers side was noted.

RESULT

After thorough analysis of data following observations are put forward:

A total of 2903 cases out of 6843 obstetrics admission, were referred to this institute during the study period and are included in the study

contributing to 42.42% of total admissions, of which 97.10% referred during intrapartum period and 2.9% patients referred during post partum period.

DEMOGRAPHICS AND REFERRAL PARAMETERS

As shown in Table 1, maximum number of the cases were of age group 21 to 30 years (78.75%) and majority were multigravida (54.77%). 40.85% cases among the referred were illiterate and only 2.06% were graduate / post graduate. 68.23% subjects were from rural areas and 31.77% subjects were from urban areas.

Maximum number of patients were referred from CHC (50.91%) followed by Sub centre and PHC (24.11%). 1.56% cases referred with verbal communication from referring facility and 98.44% were documented referrals. Only 23.87% subjects were referred in ambulance which is an important contributing factor for maternal and perinatal outcome.

Majority 63.79% of the patients were referred by Doctors and only 10.20% cases were referred with prior communication with referring facility. Most of the patients were accompanied with the ASHA worker - mitanin (71.82%). 75.75% cases referred during emergency hours and majority patients (32.75%) arrived within 4-6 hours of referral.

Table no. 1: PROFILE OF REFERRED PATIENTS

DEMOGRAPHIC PARAMETERS		NUMBER (n)	PERCENTAGE (%)
1. Age	Equal to and less than 20 years	290	9.99
	21 - 30 years	2286	78.75
	31 - 40 years	303	10.44
	More than 40 years	24	0.82
2. Gravida	Primigravida	1268	44.98
	Multigravida	1544	54.77
	Grandmultigravida	07	0.24
3. Educational status	Illiterate	1187	40.85
	Primary education (class 1- class 5)	1124	38.74
	Secondary education (class 6 - class 10)	326	11.24
	Higher education (class 11- class 12)	206	7.11
	Graduate / Post graduate	60	2.06
REFERRAL PARAMETERS		NUMBER (n)	PERCENTAGE (%)
1. Type of hospital	Sub-Centre/PHC	700	24.11
	Community health centre	1478	50.91
	District Hospitals	622	21.42
	Government medical colleges	74	2.54
	Not mentioned	29	0.99
2. Form of referral	Verbal referrals	45	1.56
	Written referrals	2858	98.44
3. Incharge of referral	Gynecologists	221	7.61
	Medical officers	1631	56.18
	Nurse	11	0.37
	ANM	175	6.02
	Not mentioned	865	29.79
4. Accompanying staff	ASHA worker (Mitanin)	2085	71.82
	Hospital staff	02	0.06
	No accompanying health care personnel	816	28.10
TOTAL		2903	100

INDICATIONS FOR OBSTETRICS REFERRALS

Table 2 presents the main indication at referral by the referring units and the diagnosis at admission in tertiary unit as recorded. In this study, most common indication for referral was Obstetrics indications which included previous caesarean sections in labour (14.39%), premature rupture of membranes (14.19%), labour pain (10.67%) and hypertensive disorder of pregnancy (0.83%). However among Obstetric indications major diagnosis at the time of admission were

normal labour (16.67%), previous caesarean sections (15.12%), premature rupture of membranes (14.53%) and hypertensive disorder of pregnancy (12.26%). Among medical indications were anaemia, hemoglobinopathy, seropositive cases and heart disease. Among fetal indications were fetal distress, IUFD, FGR, Anomaly. Technical reasons included unavailability of ICU, blood products, OT, NICU, bed. Many of the referrals turned out as normal labour during admission. 27.89 % presented with more than one obstetric diagnosis / complications.

Table no. 2: REASON OF REFERRAL AND DIAGNOSIS ON ADMISSION

Interventions done	Number	Percentage
ICU admission and cardiorespiratory support	28	0.96
Medical management	365	12.57
1.Anticonvulsant	355	97.3
2.Anticoagulant therapy	10	2.7
Haemorrhage management	414	14.26
1.Blood and blood products transfusion	305	73.67
2.Manual Removal of Placenta under GA	02	0.48
3.Repair of Genital injuries	12	2.89
4.Balloon tamponade	07	1.69
5.Step wise devascularization	75	18.11
6.Obstetrics Hysterectomy	07	1.69
7.Repair of uterus	06	1.44
Heart disease	06	0.20
Dialysis	01	0.03

MATERNAL AND FETAL OUTCOME

As shown in Table 3, among total referred intrapartum patients, 56.69% delivered vaginally, 43.02% underwent caesarean section and 0.28% underwent laparotomy for rupture uterus. Out of total 2903 subjects, 2817 delivered in our institute and 84 cases were delivered outside. 2 patients died undelivered. Among those 2817, 24 were twins and 1 was triplets delivery and so total birth count is - 2843 babies which includes 07 still birth, 76 IUFD and 2760 Live birth. 329 got admitted in NICU.

Table no. 3: MODE OF TERMINATION OF PREGNANCY

		Number	Percentage
1. Cause of death	1. Direct causes	21	84 %
	Obstetric haemorrhage	10	40%
	Hypertensive disorder of pregnancy	06	24%
	Anaemia	03	12%
	Obstructed labour	01	4%
	Amniotic fluid embolism	01	4%
	2. Indirect causes	04	16%
	Heart disease	02	08%
	AFLP	02	08%

MATERNAL MORBIDITY

Table 4 shows management of complications in referred patients which includes 0.96% patients requiring ICU care, 57% requiring medical management, 10.50% requiring blood/blood products transfusion, 0.48% patients had manual removal of placenta under GA, 1.69% requiring balloon tamponade in view of atonic PPH, 18.11% had stepwise devascularization procedure, 7 cases requiring obstetric hysterectomy and in 06 cases repair of rupture uterus was done. 06 cases of heart disease were managed and 01 underwent dialysis. Table no. 4: MANAGEMENT OF COMPLICATIONS Interventions done Number Percentage ICU admission and cardiorespiratory support 28 0.96 Medical management 365 12.57 1. Anticonvulsant 355 97.32 Anticoagulant therapy 10 2.7 Haemorrhage management 414 14.26 1. Blood and blood products transfusion 305 73.67 2. Manual Removal of Placenta under GA 02 0.48 3. Repair of Genital injuries 12 2.89 4. Balloon tamponade 07 1.69 5. Step wise devascularization 75 18.11 6. Obstetrics Hysterectomy 07 1.69 7. Repair of uterus 06 1.44 Heart disease 06 0.20 Dialysis 01 0.03

MATERNAL MORTALITY

There were 25 maternal deaths as shown in Table 5 and out of total number of maternal death during study period, 59.52% of maternal deaths were in referred patients. Obstetric haemorrhage being the leading cause of death followed by Hypertensive disorder of pregnancy.

Table no. 4: MANAGEMENT OF COMPLICATIONS

REASON FOR REFERRAL (A)			DIAGNOSIS ON ADMISSION (B)		
Reasons For Referral	Number (n)	Frequency (%)	Diagnosis on admission	Number (n)	Frequency (%)
1. Obstetric Indications	1950	67.17	1. Obstetric Indications	2377	81.88
2. Medical indications	207	7.13	2. Medical indications	357	12.29
3. Fetal indications	137	4.71	3. Fetal indications	169	5.82
4. Technical reasons	567	19.5			
5. Reason not mentioned	42	1.4			
Total referrals	2903	100	Total referrals	2903	100

DISCUSSION

The present study aimed to evaluate the maternal outcome of patients referred during intrapartum and postpartum period. The importance of referral in obstetric emergencies is related to the unpredictability of pregnancy complications and their potential to rapidly progress to become severe and life threatening.

Table no. 5: MORTALITY DATA OF 25 DEATHS

Mode of Termination of pregnancy	Number	Percentage
1. Vaginal delivery	1597	56.69
1.1 VBAC	25	1.56%
2. Caesarean section	1212	43.02
2.1 Obstetric Hysterectomy	05	0.41%
3. Laparotomy for Rupture uterus	08	0.28
3.1 Hysterectomy	02	25%
3.2 Repair of uterus	06	75%
Total	2817	100

Dr. Bhim Rao Ambedkar Memorial Medical hospital, Raipur Chhattisgarh is a tertiary care hospital, where complicated obstetric cases are referred from various peripheral government and private health centres within and the surrounding districts. The study documented the magnitude and reasons for referral to this tertiary care centre.

In the present study, maximum subjects (78.75%) were between age group of 21 - 30 years and multigravida comprises majority of cases (54.77%) which was similar to the studies done by Khade S A. et al. (2021)⁽⁶⁾ and Prakash G. et al. (2022)⁽⁷⁾. This can be explained by the fact that this age group has maximum fertility and also multiparity being the risk factor for many obstetric complications needed timely referral. Illiteracy results in ignorance of utilization of medical facilities. In the present study the educational qualification of study subjects shows that majority (40.85%) of the subjects were illiterate followed by 38.74%, who were educated till primary education. Jakhar R. et al (2019)⁽⁸⁾ and Kumari A. et al. (2022)⁽⁹⁾ also noticed similar findings. However, in Ghai A. et al (2023)⁽¹⁰⁾ majority of the study population were educated upto higher secondary and were graduates and this because they were conducted in Puducherry, south India where literacy rates are high compared to Indian average.

When referral pathway (from primary to secondary to tertiary facility) is not followed, it may cause overcrowding in the tertiary centres and reduction in quality of care. In our study 75.02% cases were directly referred from Primary health centre, subcentre and Community health centre bypassing the intermediate levels of the referral chain, which is in line with other studies like Elizabeth N. et al. (2020)⁽¹¹⁾ and Ghai A. et al (2023)⁽¹⁰⁾. The altered pattern of higher referrals from primary facilities in this study could be due to the proximity of a tertiary care facility and easy accessibility.

All peripheral health sectors should be well equipped with vehicles on road transport facilities. Inspite of Mahtari and 104 ambulance service in our state, only 23.87% subjects transported by ambulance which was comparable with studies Pratibha P. et al. (2019)⁽¹²⁾ and Kanyesigye H. et al. (2022)⁽¹³⁾. Better transportation facility in studies like Kumari A. et al. (2022)⁽⁹⁾ and Chaudhary H. et al. (2022)⁽¹⁴⁾ was due to increased availability of the new venture '108' by Gujarat government and Uttar Pradesh Government. Only 10.20% subjects were referred with prior communication via telephonic conversation similar to Ghardallau M. et al. (2018)⁽¹⁵⁾.

Majority cases 63.22% were referred by doctors similar to studies like

Maskey S. et al. (2015)⁽¹⁶⁾ and Ghai A. et al (2023)⁽¹⁰⁾. Majority (71.82%) of emergency maternal referrals in this regional tertiary care referral hospital were escorted by ASHA worker (Mitani). Mitani is a government health-run community health worker program launched in 2002 in Chhattisgarh which was India's first attempt at "state-initiated community activism" with an all-women workforce promoting collective action to support community demands for entitlements from the state⁽⁵³⁾.

Similarly in studies like Shrivastava N. et al. (2014)⁽¹⁷⁾ and Chaudhary H. et al. (2022)⁽¹⁴⁾ majority (75.75%) subjects were referred during emergency hours, due to less help available at night and lack of basic to advanced skills to manage a broad range of urgent and routine conditions.

The time spent in transit between referring and receiving health facility is an important determinant of the outcome of the referred patients. Majority subjects (32.75%) similar to studies like Shrivastava N. et al. (2014)⁽¹⁷⁾ and Jyotsna. et al (2017)⁽¹⁸⁾ came to our facility within 4-6 hours after referral. This delay is due to lack of transport, lack of money, ignorance of warning signs, poor road structures, and lack of local support.

Among the cause of referral, obstetric indications were the commonest reason with 47.64% combined contribution of previous caesarean sections in labour, premature rupture of membranes, normal labour and hypertensive disorder of pregnancy similar to studies done by Pratibha P. et al.(2019)⁽¹²⁾ and Khade S A. et al. (2021)⁽⁶⁾. Caesarean section (CS) delivery rate has increased significantly both globally and in India, thereby posing a burden on overstretched health systems. In India, the proportion of caesarean deliveries has dramatically increased to 17% (2015-16) and 21.5% (2019-21) from just 3% in 1992-93⁽¹⁹⁾.

Similar to our study, technical reasons also being the cause of referral in studies like Khade S A. et al. (2021)⁽⁶⁾ and Kumari A. et al. (2022)⁽⁹⁾. Jakhar R. et al (2019)⁽⁸⁾ also reported no mentioned cause for referral in 63 (6.21%) cases. These referrals raise high index of suspicion of all the high risk and so needs extra attention and time. However those patients in our study delivered uneventfully without any required need of specialized equipment or interventions.

Most common diagnosis at the time of admission was physiological labour pain followed by Caesarean section in labour and premature rupture of membranes. In our study almost 20% of subjects came with no risk factors other than normal physiological labour pain. Similar findings were seen in Nagar N. et al.(2019)⁽²⁰⁾ and Chaudhary H. et al. (2022)⁽¹⁴⁾.

Approximately 44% referrals in our were unindicated, with no high risk factors and were unjustifiable. Labour pain, previous caesarean sections, premature rupture of membranes and post date pregnancy were one of the major causes of referral to this tertiary care hospital that did not required any major interventions These referrals were labelled as unjustifiable as they got delivered and discharged without any need of special care and they did not develop any untoward complications.

Similarly, in studies like Chaudhary H. et al. (2022)⁽¹⁴⁾ and Kumari A. et al. (2022)⁽⁹⁾ percentage of vaginal deliveries (56.69%) in our institution were also high compared to caesarean section (43.02%). However in studies like Khade S A. et al. (2021)⁽⁶⁾ and Prakash G. et al. (2022)⁽²¹⁾ majority of the subjects delivered by caesarean section probably due to high number of patients with that particular risk factor which require surgical intervention. These differences could be ascribed to differences in different obstetrics risk among individuals in different regions.

Although, perinatal period occupies less than 0.5% of average life span, there are more deaths within this period than during the next 30-40 years. Perinatal mortality is good indication of extent of pregnancy wastage as well as quality and quantity of health care available to mother and newborn. In present study, total birth count was 2843 of which 0.24% were still birth, 2.67% were IUFD and 97.08% Live birth. 329 babies (11.92%) got admitted in NICU. Causes for still birth being: Hypertensive disorder of pregnancy, obstructed labour, antepartum haemorrhage (abruptio placentae), fetal growth restriction and gestational diabetes in our study. Similarly Ghardallau M. et al. (2018)⁽¹⁵⁾ reported 98.2% live birth and 9.3% NICU admission; Chaudhary H. et al. (2022)⁽¹⁴⁾ reported 91% live birth and 9% NICU admissions.

All critically ill obstetric patients require a multidisciplinary team approach with good intensive care monitoring and facilities for further interventions. In present study, 28 (0.96%) patients required ICU admission, mechanical ventilation and vasopressors support; 365 (12.57%) required specific medical management; 414 (14.26%) subjects managed for haemorrhage; 6 (0.2%) cases were managed for heart disease and 1 patient underwent dialysis. Maskey S. et al. (2015)⁽¹⁶⁾ reported 18.75% ICU care management. Such high ICU admissions in the above study possibly again be explained being TUTH, Kathmandu a tertiary referral hospital which receives more serious and critical patients on arrival requiring ICU admissions; Jakhar R. et al (2019)⁽⁸⁾ reported 5.3% ICU admissions; Khade SA. et al. (2021)⁽⁶⁾ reported 4% required blood transfusions, 1.83% required ICU admissions. These differences could be ascribed to differences in demographics in different region.

Maternal mortality and morbidity is important because it reflects overall health of country and country's health infrastructure. No woman should die to give life and every baby born is a life we should fight to save. Ours is a tertiary referral center receiving patients from other districts with most of the cases being referred in an already complicated moribund state. There were 25 maternal deaths in this study comprising 0.86% of total referred patients and the leading cause was obstetric haemorrhage similar to studies done by Jyotsna. et al (2017)⁽²²⁾; Jakhar R. et al (2019)⁽⁸⁾ and 13 of these died within 24 hours of admission showing delay in referral of complicated cases. Prior communication was given in only one patient of PPH with grade 4 haemorrhagic shock with very severe anaemia before referring from district hospital. 16 subjects were transported from ambulance and 8 patients were escorted by health workers. One was accompanied by doctor, one was accompanied by nurse and others were accompanied by mitanins.

In the present study, 44% deaths were due to delayed referral to appropriate health facility followed by 40% due to personal reasons like delay in seeking care, not following referral advice, no health checkups during pregnancy and remaining 16% were due to unavailability of required facility like OT facility, blood, blood products, ICU care. This study has highlighted gaps found in mortality of these patients.

CONCLUSION

Study concluded that this tertiary centers is overcrowded with both high risk and normal deliveries which dilutes the quality of care. Apart from the huge caseloads, the quality of referrals in terms of timing and data documentation is very poor, thus limiting the provision of quality care to the patient. Study found that the government led initiative of serving all necessary health services to the difficult location people though ASHA and ANM play important role as a torch bearer in maternal care in terms of counselor and birth companion.

Obstetric haemorrhage and hypertensive disorder of pregnancy is still the most common cause of maternal deaths. To avert preventable deaths we must give emphasis on the correction of anaemia and early diagnosis of hypertension in the antenatal period. The reliance on referrals to tertiary centers for obstetric care should be shifted to improving the functionality of referring centers so as to reduce the burden of multiple referrals along with a network of referral linkage to ensure speedy and appropriate referrals, with proper referral details.

RECOMMENDATIONS

Recommendations drawn after conducting this study –

Improving female education, health education and awareness at community level by mass media and non-government organizations can improve the health and social status of women in rural areas.

Development of a standard referral protocol, proper training in this regard and universal adherence to this in practice.

Improvement in transportation system by creating awareness on availability of free transport systems in our state at all levels of care.

Communication and feedback system between referring and referral centre.

Adequate supplies in referring facility (bed, blood, drugs, equipment, trained personnel).

Workshops and continued medical education or regular audits - update

clinical knowledge & skills of health personnel's.

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