

Study of Maternal and Perinatal Outcome of Referred Patients in Labour from Peripheral Hospitals

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ABSTRACT

BACKGROUND

The key to saving mother's and their babies lives is an effective referral system. The aim of this study is to record incidence, management and maternal & perinatal outcome of referred patients in labour from peripheral hospitals.

MATERIALS & METHODS

A prospective observational study was conducted from Sept. 2017 to Sept. 2019. During this period of 2yrs. a total of 2,628 referred cases in labour were admitted to Labour Room of Obstetrics & Gynaecology Department of M.K.C.G. Medical College and Hospital, Berhampur, Odisha. A detailed history, complete physical and obstetric examination, investigations sent, management and maternal & perinatal outcome of each patient were recorded.

RESULTS

Incidence of referral of obstetric cases in labour was 211 per 1000 referred cases. Primigravida constituted 65.8% of total recorded cases. Most referred cases were from rural areas (80.7%) with primary cause of referral being foetal distress (28.7%) followed by obstructed labour (21%). In this study vaginal delivery (55.4%) was the primary mode of delivery compared to Caesarean section (44%). Postpartum haemorrhage (22.8%) was found to be the most common maternal complication and birth asphyxia (28.9%) being the most common perinatal complication in this study.

CONCLUSION

Mass health education, team of well trained healthcare providers at peripheral hospitals and timely referral is crucial in achieving a satisfactory maternal and foetal outcome.

KEYWORDS

Primigravida, Postpartum Haemorrhage, Foetal Distress, Obstructed Labour, Birth Asphyxia.

Introduction

Health is an important individual need and it is one of the determinants of the level of welfare of a nation. Improving maternal and child health is one of the important healthcare goals throughout the world. This is because mother and child are highly important members of society. This is also in accord with the United Nations goals listed in the Sustainable Development Goals (SDG). One of the SDG goals is to "ensure healthy lives and promote well-being for all at all ages", including maternal and child health.¹

Everyday approximately 810 women die from preventable causes related to pregnancy and childbirth. In-between 2000 to 2017 maternal mortality ratio has dropped by about 38% worldwide. 94% of all maternal deaths occur in low and middle income countries.² An estimate shows that one maternal death occur with approximate 15% of pregnancies developing complications which necessitates tertiary obstetric care and the vast majority of maternal deaths and injuries are avoidable when women have access to health care before, during and after childbirth.³

WHO commends India for its ground-breaking progress in recent years in reducing the maternal mortality ratio (MMR) by 77%, from 556 per 100 000 live births in 1990 to 130 per 100,000 live births in 2016. India's present MMR is below the Millennium Development Goal (MDG) target of 139 and puts the country on track to achieve the SDG target of an MMR below 70 by 2030.⁴

India is rich in its social, cultural, & geographical heritage. About 80% population still lives in rural areas. Disproportionate concentration of health services in urban areas & ineffective access of rural population to these services results in huge proportion of obstetric emergencies being referred to referral hospitals and institutions. Lack of specialist services and transport facilities at the periphery further results in delayed referral to tertiary centers, thus increasing the foetomaternal morbidity and mortality. The present study was undertaken in the Department of Obstetrics & Gynaecology, MKCG Medical College and Hospital, Berhampur to evaluate & analyze the maternal and perinatal outcome of referred patients in labour.

AIMS AND OBJECTIVE:

- To record incidence of referred cases in labour.
- To study the management of these referred cases.
- To record incidence of various maternal and foetal outcome of these cases.

MATERIAL AND METHODS

The study entitled "Study of Maternal and Perinatal Outcome of Referred Patients in Labour from Peripheral Hospitals" was worked out in the Department of Obstetrics & Gynaecology, M.K.C.G. Medical College & Hospital, Berhampur, Odisha.

Duration of Study

The period of study extended from September 2017 to September 2019. During this period a total number of 2,628 referral cases in labour were identified.

Study Design

This is a prospective observational study.

Study Population

All patients in labour referred from peripheral hospital and admitted to Dept. of Obstetrics and Gynaecology of MKCG Medical College and Hospital during the study period.

Study Setting

Labour room of Obstetrics and Gynaecology Department of MKCG Medical College & Hospital, Berhampur.

Inclusion Criteria

All referred cases in labour.

Exclusion Criteria

- Patients not in labour
- Cases those are not referred.

METHOD

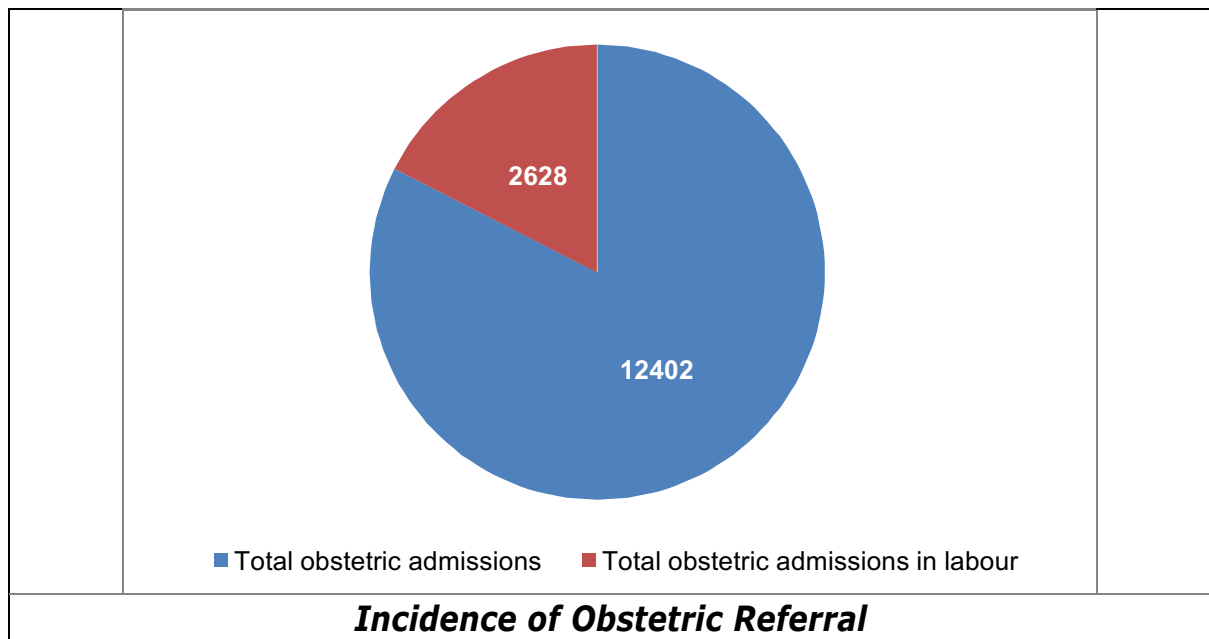
- A thorough and complete history will be taken from referred cases in labour.
- Complete physical and obstetric examination will be done.
- Case specific investigation carried out as mandated by clinical condition of the patient shall be recorded.
- Management of cases as per cause of referral, final diagnosis, mode of delivery and factors contributing to decision making on mode of delivery shall be noted.
- Foetal outcome, NICU referral and any complications within 7 days of delivery if any shall be noted.

RESULTS

This study was undertaken in the department of Obstetrics and Gynaecology, M.K.C.G. Medical College and Hospital, Berhampur, Odisha from September 2017 to September 2019. During these 2 year of study period 21,128 women delivered at M.K.C.G. Medical College, Berhampur.

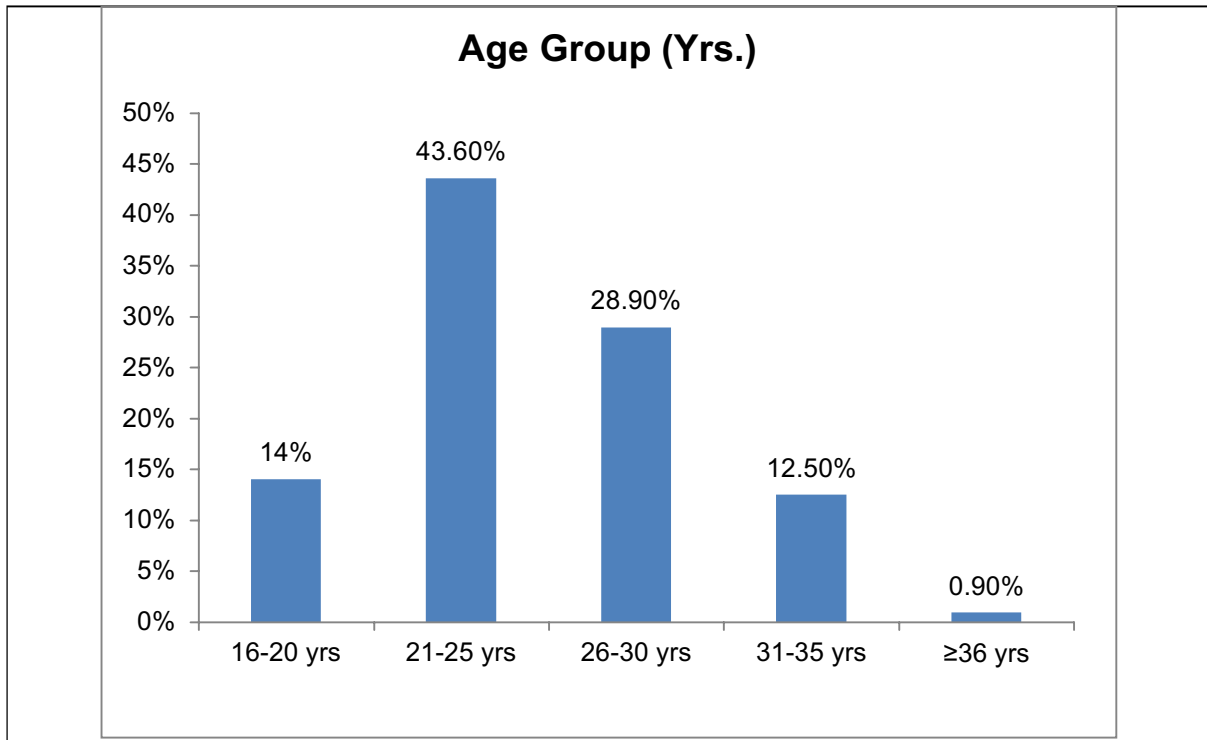
Total obstetric admissions in the hospital	24526
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Total referred obstetric cases	12402
Total number of deliveries	21128
Total referred obstetric cases in labour	2628
Incidence of referral	211 per 1000
Table 1: Incidence of Obstetric Referral	



The above table describes, out of 24,526 obstetric admissions to the Obstetrics and Gynaecology department of MKCG Medical College and Hospital 12,402 cases were referred. A total of 21,128 deliveries were conducted in the institution, out of which 2,628 obstetric cases were referred from peripheral hospitals in active labour. Thus, the incidence of referral of obstetric cases in labour is 211 per 1000 referred cases.

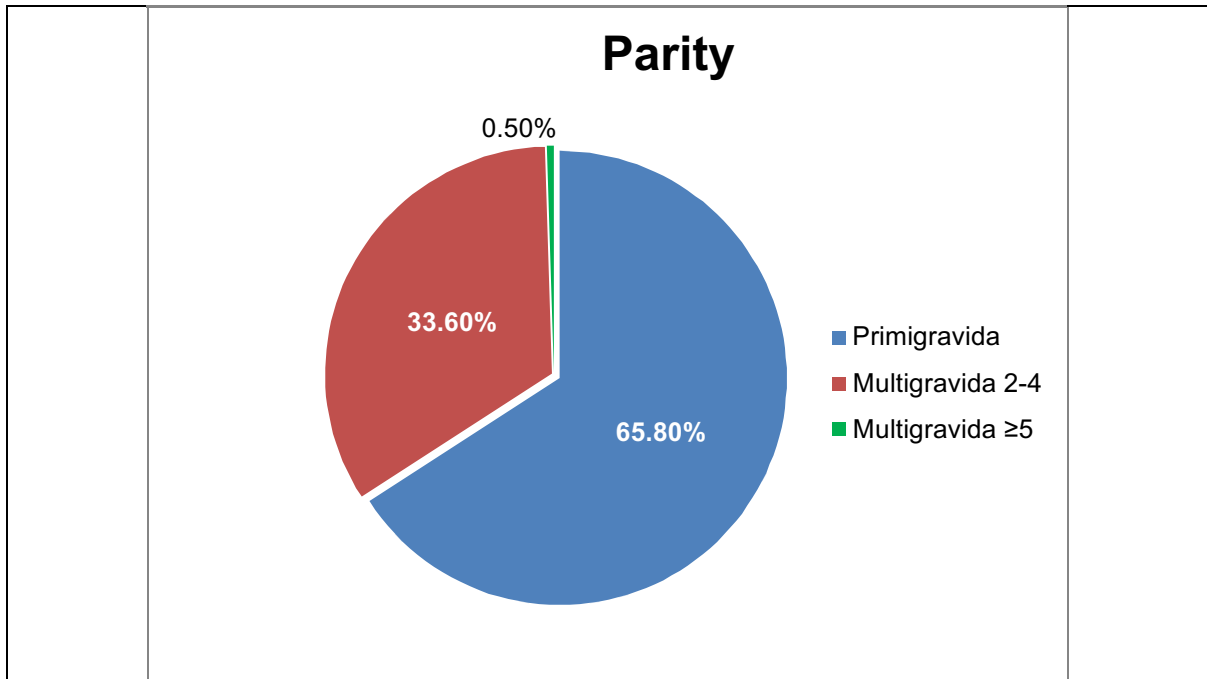
Age Group in Years	Cases	Percentage (%)
16-20	369	14%
21-25	1146	43.6%
26-30	759	28.9%
31-35	330	12.5%
≥36	24	0.9%
Table 2: Age Distribution		



From the above table we found that maximum of the referred case 43.6% belong to 21 to 25yr age group and minimum of 0.9% cases belong to ≥ 36 yr age group. Out of the rest 14% were between 16 to 20yr age, 28.9% between 26 to 30 yr age and 12.5% case between 31 to 35yr of age.

Parity	Cases	Percentage (%)
Primi	1730	65.8%
Multi 2-4	884	33.6%
≥ 5	14	0.5%

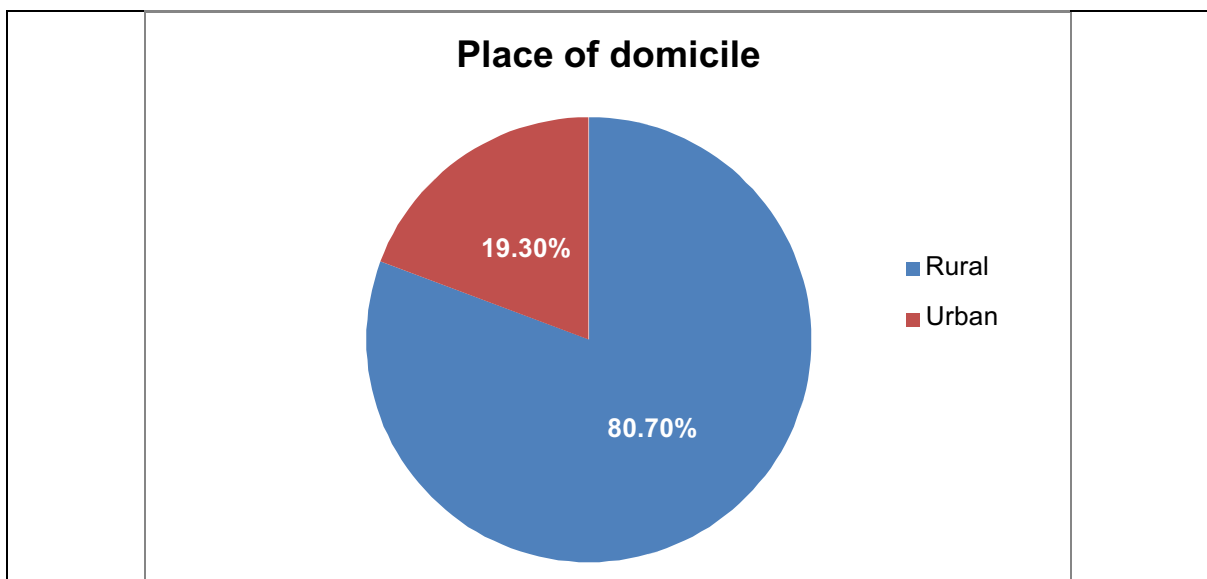
Table 3: Parity



The above table shows 65.8% cases out of total obstetric referrals in labour were primigravida. Among the multigravida 33.6% belong to 2-4 parity and rest 0.5% cases were grand multipara (≥ 5).

Domicile	Cases	Percentage (%)
Rural	2120	80.7%
Urban	508	19.3%

Table 4 : Place of Domicile

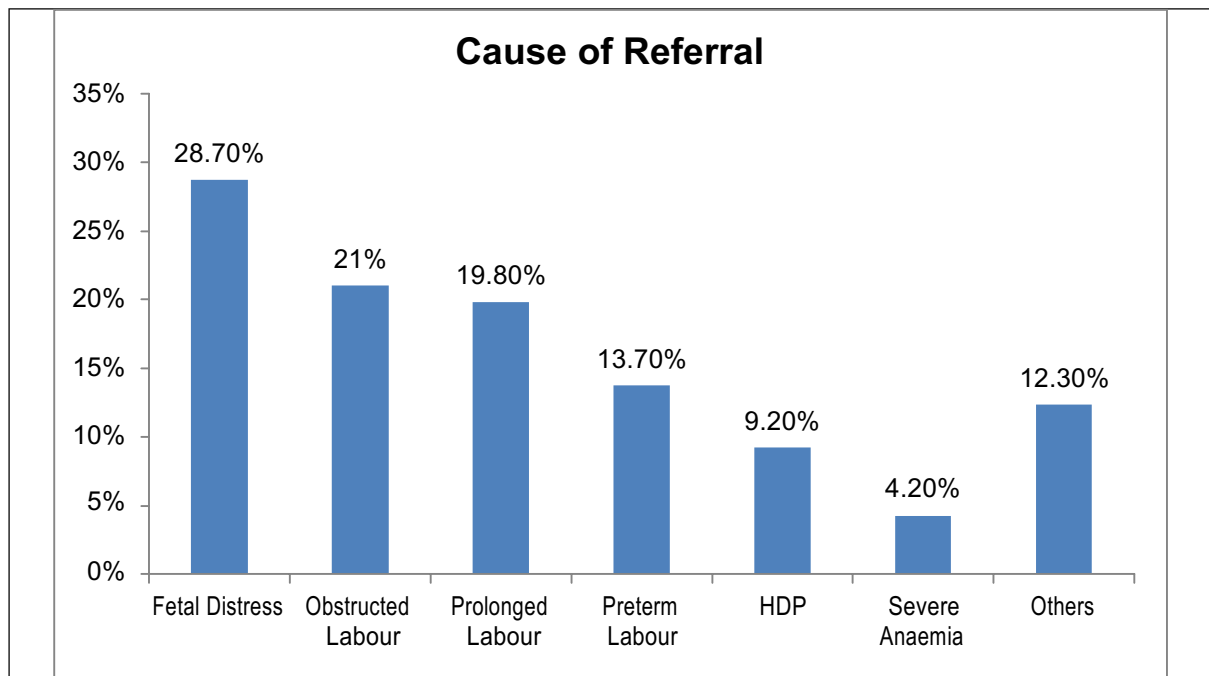


The above table depicts majority 80.7% of referral cases were from rural areas and rest 19.3% were from urban areas.

Causes	Cases	Percentage (%)
Fetal Distress	754	28.7%
Obstructed labour	552	21%
Prolonged labour	522	19.8%
Preterm labour	362	13.7%
Hypertensive disorder of pregnancy	242	9.2%
Severe anaemia	112	4.2%
Others*	325	12.3%

Table 5: Causes of Referral

*includes CPD, oligohydramnious, polyhydramnious, previous caesarean section, malpresentation, malposition, compound presentation, APH, heart disease, BOH, GDM, IUGR, hepatitis, PLHA, Rh negative, twin, sickle cell anaemia, asthma, fibroid, malaria, hypothyroidism and prolapsed.

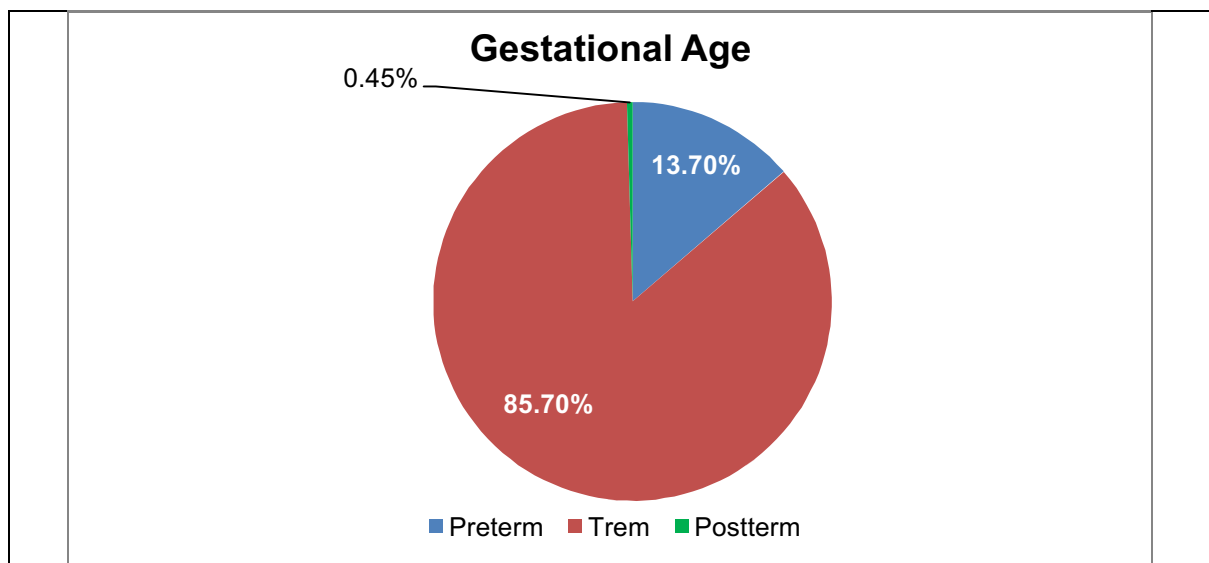


From Table no. 16 it is evident that primary cause of obstetric referral is fetal distress and in our study it accounts upto 28.7%, followed by obstructed labour (21%), prolonged labour (19.8%), preterm labour (13.7%), hypertensive disorders

of pregnancy (9.2%), severe anaemia (4.2%) and other minor causes. Many of the causes of referral are combination of two or more causes.

Gestation	Cases	Percentage (%)
Preterm	362	13.7%
Term	2254	85.7%
Postterm	12	0.45%

Table 6: Gestational Age

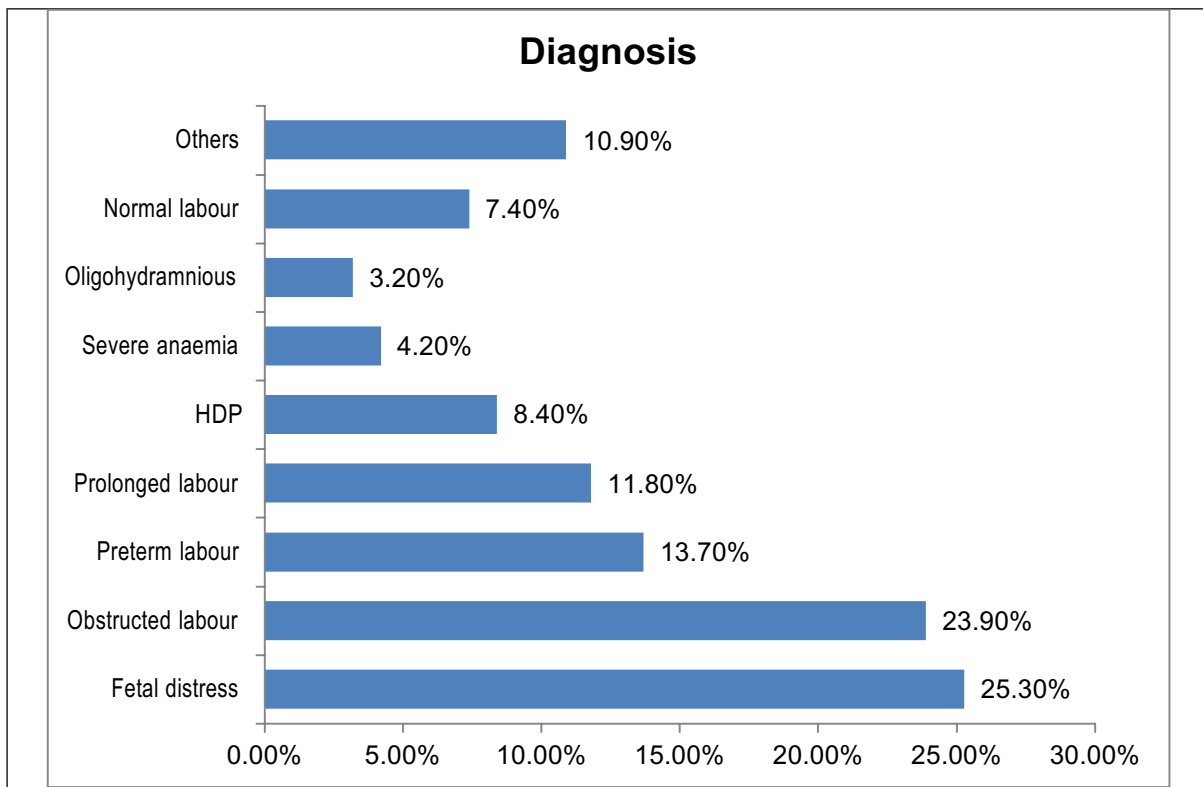


The above table shows that most of the patients were received in term pregnancy which accounts upto 85.7%, followed by preterm pregnancy (13.7%) and lastly postterm pregnancy (0.45%).

Diagnosis	Cases	Percentage (%)
Fetal distress	665	25.3%
Obstructed labour	630	23.9%
Preterm labour	362	13.7%
Prolonged labour	312	11.8%
Hypertensive disorder of pregnancy	222	8.4%
Severe anaemia	112	4.2%
Oligohydramnios	84	3.2%
Normal labour	194	7.4%
Others*	288	10.9%

Table 7: Diagnosis

*includes CPD, malpresentation, polyhydramnious, previous caesarean section, malposition, compound presentation, rupture uterus, APH, heart disease, congenital anomaly, BOH, GDM, IUGR, hepatitis, PLHA, Rh negative, twin, sickle cell anaemia, asthma, fibroid, malaria, hypothyroidism and prolapse.

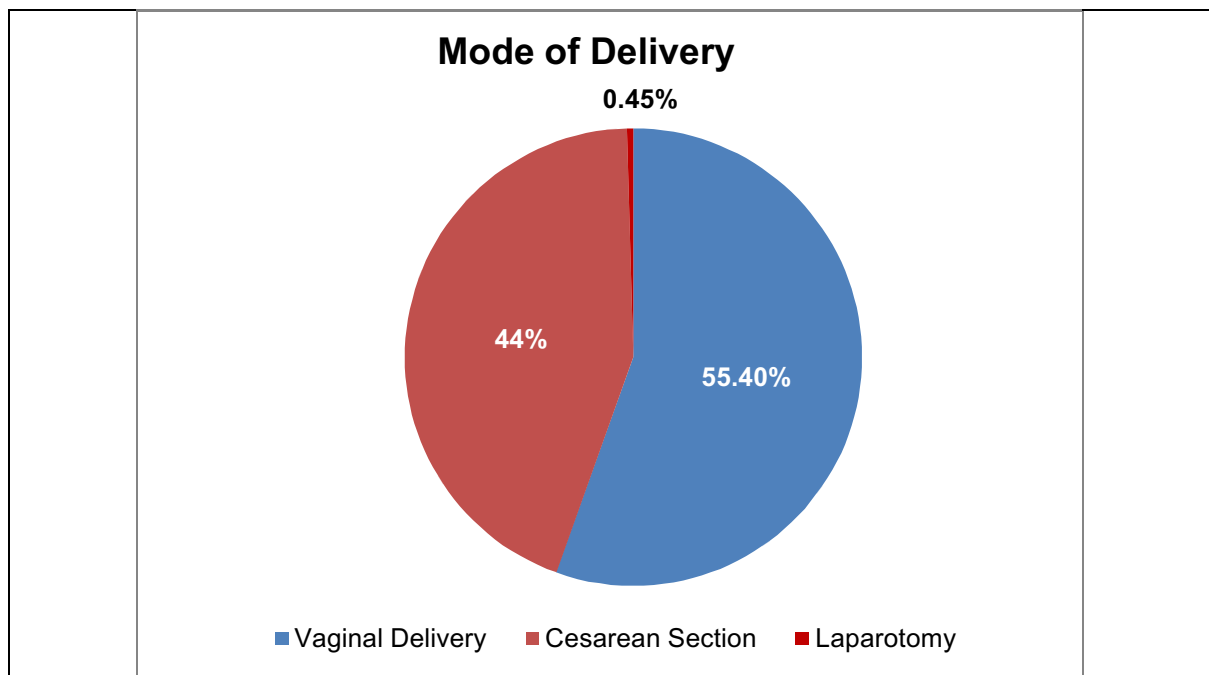


From the above table it is evident that fetal distress as the diagnosis in 25.3% cases is on the top of the list which is followed by obstructed labour (23.9%). Hypertensive disorder of pregnancy constituting of preeclampsia, eclampsia and gestational hypertension constitute 8.4% of total referrals. Another 7.4% of cases were diagnosed at the time of admission to be in labour.

In this study preterm labour was the diagnosis in 13.7% cases. Percentage of cases diagnosed as prolonged labour 11.8%, severe anaemia 4.2% and oligohydramnious 3.2% of total cases. To the huge list of diagnosis minor amount were contributed by CPD, malpresentation, polyhydramnious, previous caesarean section, malposition, compound presentation, rupture uterus, APH, heart disease, congenital anomaly, BOH, GDM, IUGR, hepatitis, PLHA, Rh negative, twin, sickle cell anaemia, asthma, fibroid, malaria, hypothyroidism and prolapse. Many of the diagnosis was combination of two or more factors.

Mode of delivery		Cases	Percentage (%)
Vaginal delivery		962	36.6%
Assisted vaginal delivery	Ventouse	372	14.1%
	Forceps	124	4.7%
Cesarean section		1158	44%
Laparotomy		12	0.45%

Table 8: Mode of Delivery

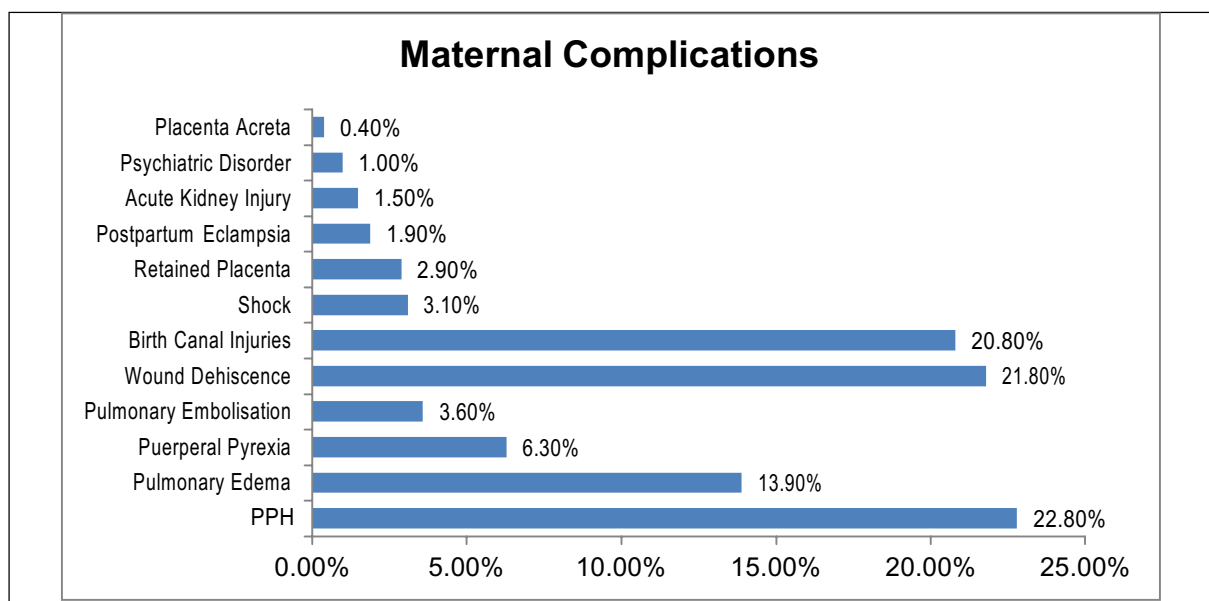


The above table depicts majority of case underwent vaginal delivery (55.4%) out of which 36.6% had normal vaginal delivery, 14.1% underwent ventouse extraction and 4.7% cases were delivered with the help of forceps. Cesarean section was done in 44% cases. Laparotomy was done in 0.45% cases mostly for rupture uterus.

Maternal complications	Cases	Percentage (%)
Postpartum Hemorrhage	138	22.8%
Pulmonary edema	84	13.9%
Puerperal pyrexia	38	6.3%
Pulmonary embolisation	22	3.6%
Wound Dehiscence	132	21.8%
Birth canal injuries	126	20.8%

Shock	19	3.1%
Retained placenta	18	2.9%
Postpartum eclampsia	12	1.9%
Acute kidney injury	9	1.5%
Psychiatric disorder	6	1%
Placenta Acreta	3	0.4%
Total	607	100%

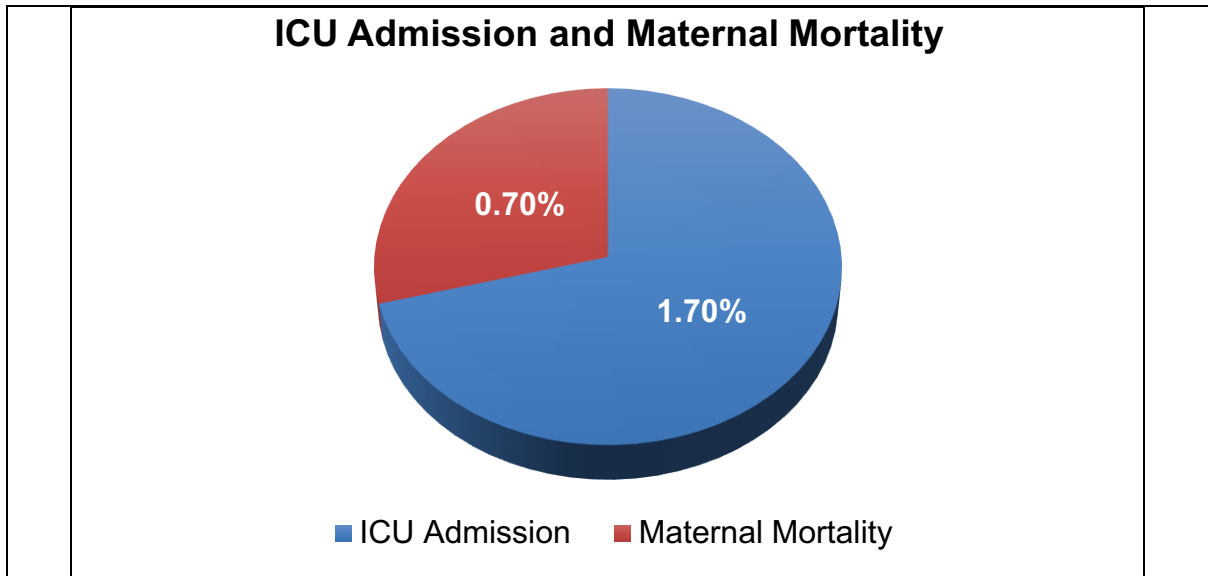
Table 9: Maternal Complications



The above table demonstrates most common maternal complication to be postpartum hemorrhage 22.8%, followed by wound dehiscence and birth canal injuries constituting 21.8 and 20.8% cases respectively. Least common complications being acute kidney injury (1.5%), psychiatric disorders (1%) and placenta acreta (0.4%). Some of the patients had combination of two or more complications.

	Cases	Percentage (%)
Total ICU admissions	46	1.7%
Maternal mortality	18	0.7%

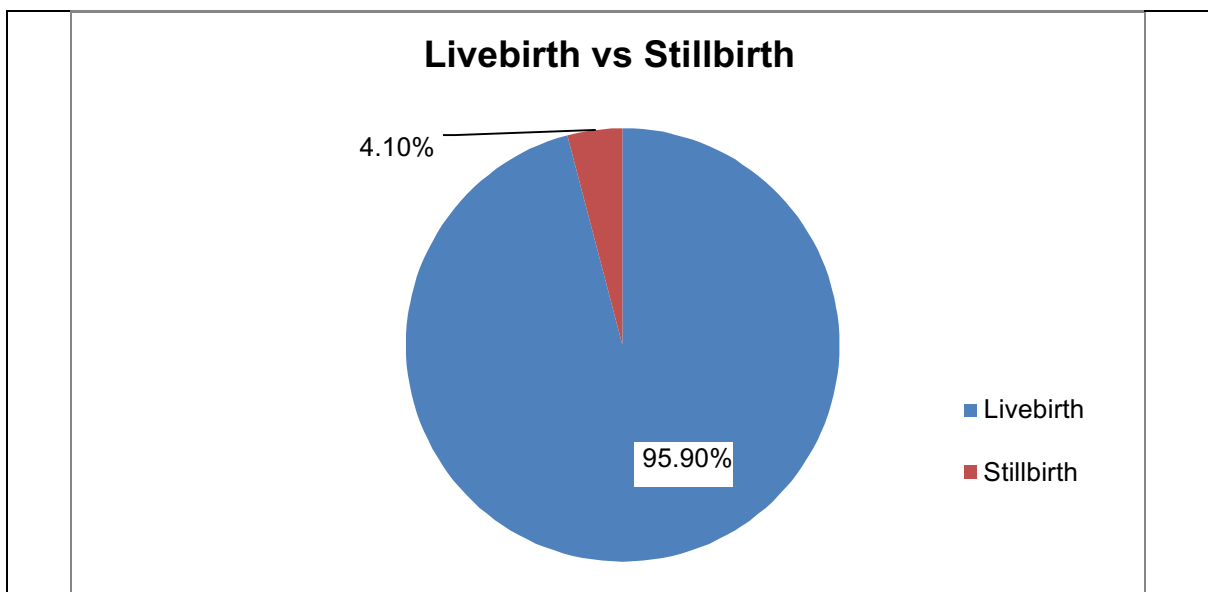
Table 10: ICU Admission and Maternal Mortality



The above table shows that out of total referred obstetric cases in labour 46 cases (1.7%) underwent ICU admission and 18 mothers (0.7%) died.

Births	Cases	Percentage (%)
Livebirth	2520	95.9%
Stillbirth	108	4.1%

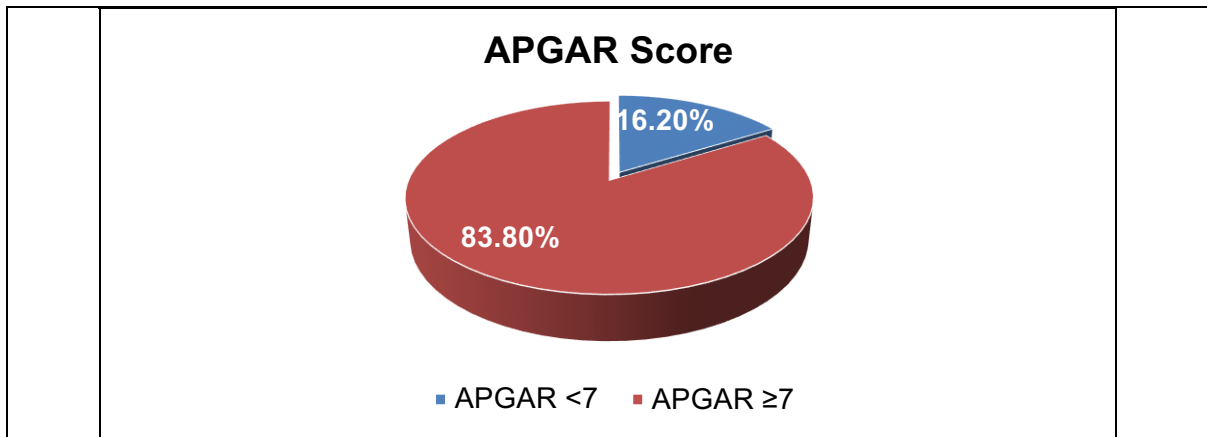
Table 11: Live Birth Vs. Stillbirth



The above table shows that 2520 number (95.9%) of women had given birth to live babies and only 4.1% women to stillborn.

APGAR Score	Cases	Percentage (%)
<7	408	16.2%
≥7	2112	83.8%
Total	2520	100%

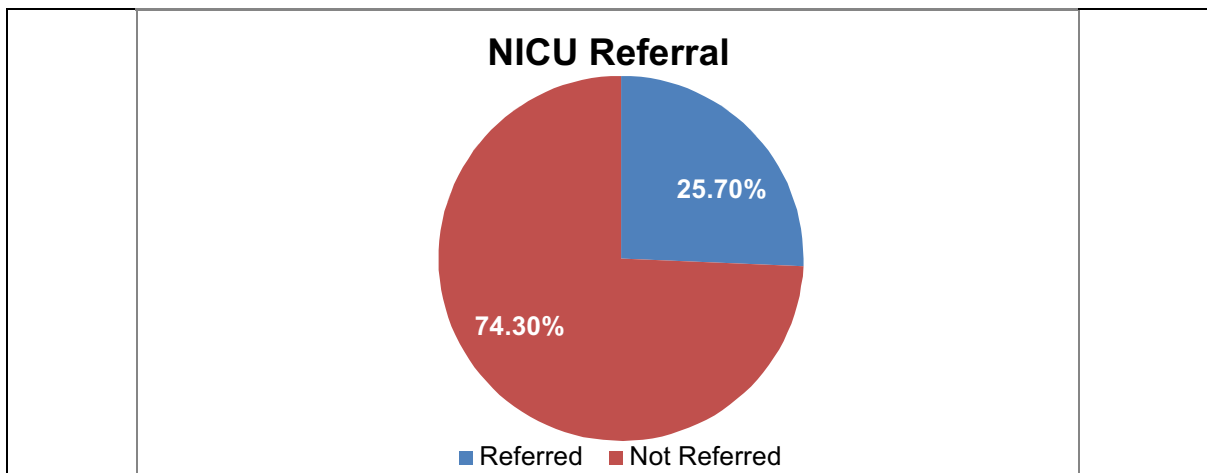
Table 12: APGAR Score



The above table depicts APGAR score of ≥7 in 83.8% cases suggesting a favourable outcome and 16.2% babies had APGAR score <7 indicating a poor outcome.

Referral to NICU	Cases	Percentage (%)
Referred	648	25.7%
Not Referred	1872	74.3%
Total	2520	100%

Table 13: NICU Referral



The above table shows 648 babies (25.7%) out of total 2,520 liveborn had complications and required NICU care and majority of the delivered babies (74.3%) were healthy and didn't require special care.

Perinatal complications	Cases	Percentage (%)
Birth asphyxia	120	28.9%
Respiratory distress syndrome	114	27.4%
Jaundice of newborn	61	14.7%
Birth injuries	33	7.9%
Intracranial hemorrhage	24	5.7%
Seizure	17	4%
Hemolytic disease of newborn	14	3.3%
IUGR	12	2.9%
Congenital Anomaly	11	2.6%
Perinatal infection	9	2.1%
Total	415	100%

Table 14: Perinatal Complications

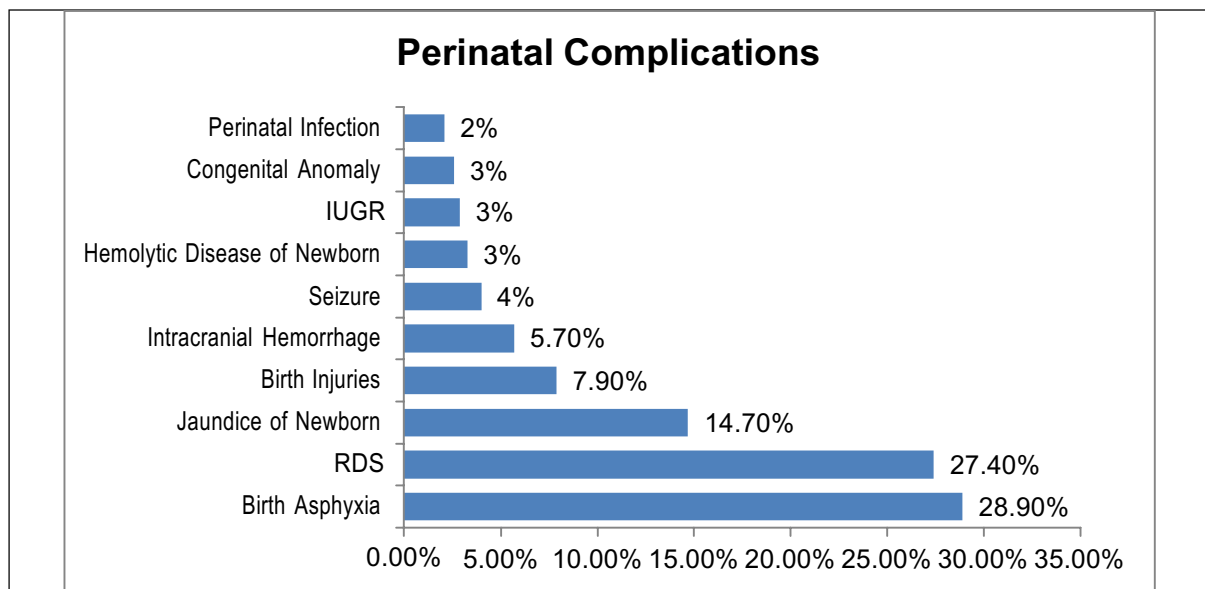
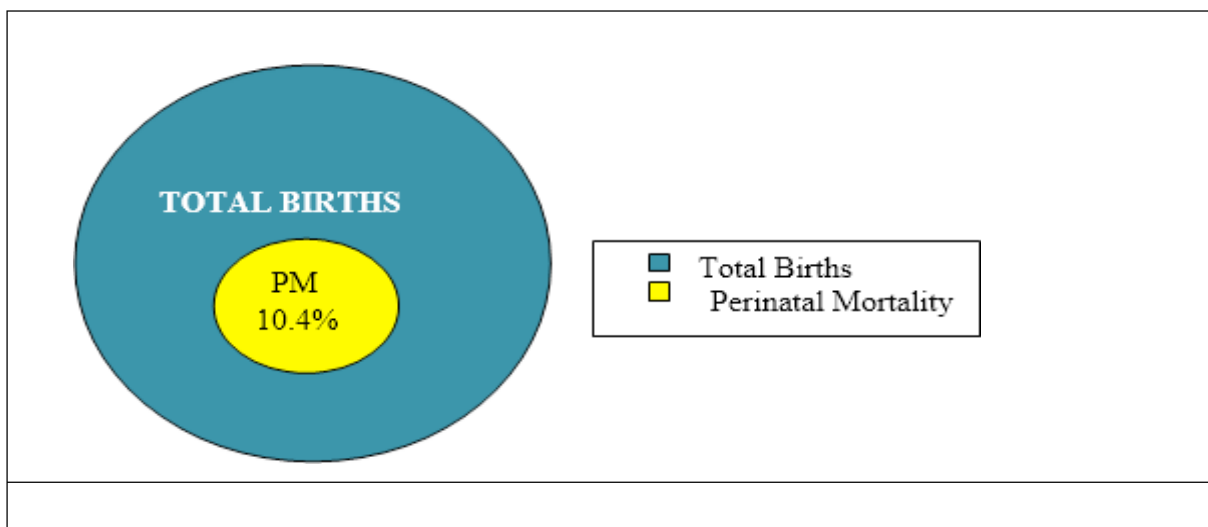


Table no. 30 shows that perinatal complication of birth asphyxia was seen in 28.9% cases out of total liveborn babies, followed by respiratory distress syndrome (27.4%) and jaundice of newborn (14.7%). Birth injuries were found to be in 7.9% cases and intracranial hemorrhage in 5.7% cases. Least common complications

being seizure, HDN, IUGR, congenital anomaly and perinatal infection in 4%, 3%, 3%, 3% and 2% cases respectively.

Fresh stillborn (FSB)	Masserated stillborn (MSB)	Early neonatal mortality (ENM)	Perinatal mortality (FSB+MSB+ENM)	%
65	43	167	275	10.4%

Table 15: Perinatal Mortality



The above table depicts 65 cases of fresh stillborn, 43 cases of macerated stillborn, and 167 cases of early neonatal mortality. Summing up of all these gives us the perinatal mortality. 10.4% being the perinatal mortality in this study.

DISCUSSION

In our study incidence of in-referral patients in labour was found out to be 211 per 1000 of total referred obstetric admissions.[Table 1] Referred obstetric admissions in our institute was 12,402 in the whole 2 yr study period, which was found out to be 50.56% of total obstetric admissions to the hospital. Total 21,128 deliveries were conducted during the study period out of which 2,628 cases(12.4%) were referred which is comparable with the study by Dr Gupta Priyanka Rohit et al. where she documented total number of admission of 9,551 cases out of which 1468(15.37%) were the referred¹⁷. Similarly studies conducted by Hiteshree C Patel et al., Swain et al and Rekha Jakhar et al.(2016) showed proportion of

obstetric referral cases delivered in their tertiary care institute were 15.2%, 15.9% and 9.96% respectively.

The incidence of delivery of referred cases in our study was lower compared to study by Divya Goswami et al which showed in labour referrals were 56% whereas study by Heera Shenoy T et al reported 48.38% of patients referred in labour. Similar studies conducted by Puri Alka et al, Umesh Sabale et al., Jyoti Bindal et al., showed the documented percentage of deliveries of referred case in their institution as 24.16%, 17.83% and 17.74% respectively. It is for the reason that most of the uncomplicated cases are managed in the nearby City hospital and Christian hospital. Only the complicated cases are referred to our institution for management.^{6,19,21,31}

Table 2 shows that maximum number of patients referred were in the age group of 21-30yrs was 72.5% out of which 43.6% cases were between 21-25 yr. which is comparable to study conducted by Jyotsana et al.(2017), Rekha Jakhar et al.(2016), Devneni and Sodumu, and Heera Shenoy et al. documented 71%, 70.2%, 73% and 73.4% of cases between 21 to 30yrs of age respectively. In this age group maximum number of referrals are seen as this is the most common age of marriage in our country^{25,32}.

Studies which reported higher value compared to this present study are Jyoti Bindal et al (2017) Gupta et al.(2016) and Nagar N et al observed maximum number of obstetric patients were in the age group from 20-30 years was 87%, 86.98% and 83.2% respectively. Also Umesh Sabale et al.(2015) and Sanju Aggarwal et al. in their studies observed maximum number of patient 58.16% and 52.6% in the 21- 25 years of age group^{6,20,31}.

Studies which reported lower value compared to this present study are Pandya and Patel(2015) reported that 64% referred cases belonged to age group of 21-30 years. Similarly Najam R et al reported maximum referral of 69.75% in this age group³³.

Teen age pregnancy <20 yrs. in this study was found to be 14% which is similar to study by Dr. Shivani Badal et al who documented 13% of referral below the age of 20 yrs²⁸. Similarly Sanju Aggarwal et al. reported 13.7 % cases were below the age of 20 yrs.³¹.

Studies which showed higher rates of teen age pregnancy than our study are Najam R et al who reported 17.3% of referral below the age of 20 yrs. whereas 25.2% was documented by Rekha Jakhar et al in her study. The cause of higher referral found in these two studies as pregnancy complications are more in teen age pregnancies³³.

Studies which showed lower rates of teen age pregnancy compared to our study are Heera Shenoy et al. reported 6.5% were below 20 yrs. of age. Similarly Jyotsana et al, Gupta et al and Nagar N et al. documented 7%, 3.67% and 5.75% referrals below the age of 20 yrs. respectively. Higher percentage of patients are referred below the age of 20yrs compared to above studies because in rural areas women get married most commonly at an earlier age and our centre gets maximum referral from these areas^{25,32}.

Out of total referred case in labour 1740 patients (66.2%) were primigravida [Table 3]which is higher than the studies by Mariem Ghardallou et al primiparity was reported in 114 (22.8%) cases also Morsheda Banu et al. had found that around 50% of the women wereprimigravida²⁶. Similar studies conducted by Dr Gupta Priyanka Rohit et al. and Umesh Sabaleet al, Dr. Shivani Badal et al, Gadhiali and Jyotsana et al. showed majority of patients were primigravida in 52.17%, 53.95%, 41.83%, 44.8% and 46% respectively. Primigravida constituted majority of the referred patients as they are going to deliver for the first time which carries maximum risk of the obstetric complications^{6 14,17,25,28}.

In our study multipara referral of 2-4 parity constituted 33.6% and grand multipara ≥ 5 parity in 0.5% cases which is found to be higher compared to study conducted by Mariem Ghardallou et al multiparous: 140 (28%) and above 5 parity: 8 (1.6%)¹⁴.

Studies those having multipara and grand multipara referral lower compared to our study are by Dr. Shivani Badal et al who showed among the referral group there were 45.75% multiparous (P1-3) and, 3.92% grand multiparous²⁸. Similarly Gadhiali,Heera Shenoy et al, Najam R et al and Jyoti Bindal et al noted 42%, 50%, 44.88%, 50% multigravida and 13.2%, 1.6%,20.5% grandmultigravida in their series respectively. This is due to the fact that delivery in multi is relatively easier and less complicated so managed easily at PHCs, CHCs or FRUs^{20,32,33}.

Table 5 showed that majority of our referral cases were from rural areas (80.7%) which is comparable to study by Heera Shenoy et al. whoreported 82.3% were from the rural areas. Similarly Vinayak et al documented 80.5% referral from rural areas³².

Higher rates of referral from urban areas compared to our study (19.3%) was found in the study by Rathi et al. which showed 67% patients were from urban area. Higher referral from urban population in Rathi et al study is due to location of the tertiary centre of study in urban area.

In comparison to present study lower rates of referral from rural areas was seen in studies by Mariem Ghardallou et al whoreported 57.8% from rural areas.

Similarly Wahane et al and Umesh Sabale et al reported 77% and 63.42% from the rural set up respectively. Higher case referral were from rural areas as majority of the population of southern Odisha live in rural areas and also lack of proper health care facility in rural areas compel them to be transferred to higher centres⁶
¹⁴.

Bhaskar Raoreported high incidence of home deliveries by untrained dais and midwives which is more in rural areas. This shows lack of health services in rural areas. Limaye highlighted the poor maternal and foetal outcome due to improper management by untrained birth attendants in rural areas.

The primary cause of referral in this study was fetal distress (28.7%) followed by obstructed labour (21%) and prolonged labour (19.8%) whereas Jyotsana et al. reported Hypertensive disorders of pregnancy (31%) followed by antepartum hemorrhage (20%) were the major causes of referral to the tertiary care center. 10% cases were referred in view of anemia followed by 18% who were referred for non availability of blood bank facilities and 17% for previous caesarean sections
²⁵

Similarly Dr Gupta Priyanka Rohit et al reported preeclampsia & related conditions were the major indication of referral to the tertiary care institute comprising 22.27% of the cases. This is followed by anaemia (18.05%) and in malpresentations(15.19%) commonest being breech ¹⁷.

Divya Goswami et al most common reason for referral was Pregnancy induced hypertension (19.48%) followed by Previous one or more LSCS (13.64%). This was followed by APH (9.74%), oligo/IUGR (5.84%), twins (3.25%), obstructed labour (3.25%) and malpresentation (1.30%). 22 patients were referred for medical disorders complicating pregnancy of which the most common was anaemia (4.54%)¹⁹.

Rathi et al.; noted that majority of the cases were referred for hypertensive disorders of pregnancy (26%), preterm labour (26%), and medical disorders complicating pregnancy (21%). The most common cause of referral of the patient by Konar et al was hypertension (34%) hemorrhage (31%) and sepsis (18%) and was responsible for maternal mortality also. In the above studies Hypertensive disorder of pregnancy was the most common cause of referral as in these studies because of the fear of landing into complications and management difficulties whereas it is fifth most common cause of referral in our study as in Odisha maximum number of doctors in the peripheral hospitals are given BEmOC (Basic Emergency Obstetric Care) training from time to time.

Mariem Ghardallou et al. There were 32 reasons for referral and the commonest indications were premature rupture of membranes (14.1%) and foetal distress (13.5%)¹⁴.

Rekha Jakhar et al reported majority of patients referred for labour pain and for better management of active labour, 368 (36.29%), previous caesarean section 116 (11.44%), hypertensive disorders of pregnancy 74 (7.30%), APH 66 (6.51%) and anemia (8.58%). Panchal and Patel reported that the common causes of referral were anemia (15%) and hypertensive disorders of pregnancy (15%).

A study done by Patel HC et al.; causes of referral were preeclampsia (16%), meconium stained liquor (5%). Hypothyroidism was seen in 20.16% and 16.12% had diabetes complicating pregnancy. Caesarean section accounted for 83% of referrals. In this study by Jyoti Bindal et al majority of patients were referred for anemia (25.13%) followed by hypertensive disorders (16.45%) and hemorrhage (13.18%)^{20, 21}.

In a study done by Onwudiegwu U et al in Nigeria showed that obstetric haemorrhage (24.6%) was the most common cause of referral followed by labour disorders (19%) and hypertensive disorder (19%)⁴⁷. 27.6% referrals were for hypertensive disorders and 34.5% were for preterm labour in the study by Agarwal et al.

Pre-eclampsia was detected in 11% and severe anaemia in 8% of all pregnant women in the study by Alehgen in 2012. Anaemia was prevalent in 38.7% and HDP of 33.06% in the study by Shenoy HT et al (2018) compared to Rathi et al 46%. Asthma was significant morbidity among public sector referrals (p value-0.001) as in Ohn et al.^{24,50}

Hitesh J. studied in-referrals in Rajasthan had reasons such as obstructed labour (25%), antepartum haemorrhage (16%), pregnancy induced hypertension (16%) were most common. In our study fetal distress was the primary cause of referral as this study only includes patients referred in labour. Also percentage of referral of obstructed labour and prolonged labour cases are more in our study and lack of proper neonatal care facilities at peripheral hospitals.[Table 5]⁵¹

In our study most of the patients were received in term pregnancy which accounts upto 85.7%, followed by preterm pregnancy (13.7%) and lastly post term pregnancy (0.45%).[Table 17] This study includes only referred patients in labour and as we know that most patients go into labour around term therefore percentage of term pregnancies are more in our study.

In this present study fetal distress as the diagnosis in 25.3% cases is on the top of the list which is followed by obstructed labour (23.9%). Hypertensive disorder

of pregnancy constitute 8.4% of total referrals. Whereas Rekha Jakhar et al in her study mentioned majority of patients were referred in labour pain and for better management of active labour 368 (36.29%), previous caesarean section 116 (11.44%), hypertensive disorder of pregnancy 74 (7.30%), antepartum hemorrhage (APH) 66 (6.51%) and anemia 87 (8.58%).

Mariem Ghardallou et al. the patient's general conditions on arrival to the receiving maternity was found to be preserved in 420 (98.8%) women. The most frequent indications for referral in those in poor condition were haemorrhagic shock, unstable hemodynamic status, hypertension, and severe anaemia. Among women referred, before delivery, foetal presentation was vertex in 452 (93.7%), breech in 14 (2.9%), transverse in one (0.2%) and face in one (0.2%). Membranes were intact in 243 (50.2%) of cases. The cervix was at least 4cm dilated in 295 (60%) of cases ¹⁴.

Rathi Charu et al (2010) noted that condition of patients on admission was stable in 54.54% rural, 58% urban patient and critical in 9.09% rural & 11.9% urban patients. Umesh Sabale et al. reported 75.53% of the referred patients referred were in stable condition, while 6.05% patients were irritable & 18.42% were critical on admission. Gandhiali et al reported that 0.88% were in poor condition on admission. The principal reason behind fetal distress was obstructed and prolonged labour being the most common diagnosis in our study is, as our study takes into account only those patients referred in labour⁶.

Percentage of disparity in diagnosis between the referring institute and our diagnosis is 14.9% out of total referral. 12.2% of cases which were referred with a diagnosis of fetal distress were found to be in labour, similarly 7.3% patients had obstructed labour. 3 cases (5.9%) referred with diagnosis of fetal distress were found to be breech presentation and 2 cases (4%) referred as breech was diagnosed to be face presentation. Similarly 9 cases (2.3%) referred as fetal distress were found to be CPD and 5 cases (1.2%) referred for CPD were diagnosed to have all parameters normal and in labour and delivered vaginally.

In our study majority of case underwent vaginal delivery (55.4%) out of which 36.6% had normal vaginal delivery, 14.1% underwent ventouse extraction and 4.7% cases were delivered with the help of forceps. Caesarean section was done in 44% cases. Laparotomy was done in 0.45% cases mostly for rupture uterus. These results are comparable with Sanju Aggarwal et al reported 54.2% had spontaneous vaginal delivery, 0.6% assisted breech delivery, 2% VBAC, 40.8% caesarean section and 2.4% laparotomy cases³¹. Jyotsana et al. reports out of total referred cases, 51% had vaginal delivery (either spontaneous or induced), 41%

had caesarean section and 7% were managed conservatively (delivered outside). 1% had laparotomy²⁵. Similar results are seen in the study by Divya Goswami et al studied a total of 67 patients (43.51%) needed surgical management, 54 (35.06%) patients had vaginal deliveries and the rest were managed conservatively (21.43%). The most common surgery was LSCS in 55 patients followed by laparotomy and salpingectomy in 6 patients¹⁹. Also ⁶ Umesh Sabale et al. showed caesarean rate of 42.11%. Vaginal delivery rate was 78% in spite of high risk conditions and various complications in Devineni et al.

Higher rates of caesarean deliveries compared to our study was seen in studies by Ambreen et al reported 62% caesarean deliveries. Goswami et al had 43.5% caesarean deliveries. Panchal and Patel et al., (2015) study mode of delivery in majority of the patients is caesarean section (64%) which is comparable to the study conducted by Ayesha et al. (53.3%)⁵⁶. Nazam R et al reported about 58.33% were delivered by caesarean section and 41.67% delivered vaginally out of which 21.07% were instrumental deliveries. Sorbye et al. found that referral status contributed substantially to the increased caesarean section rate, which was 55% in formally-referred. Higher rate of caesarean deliveries were seen in the above studies because large number of referrals were obstructed labour, prolonged labour and fetal distress, also higher values of phase 1 and phase 2 delay in referral patients was found in these studies.

Lower rates of caesarean section compared to our study was seen in studies by Mariem Ghardallou et al. where 102 (20.6%) had caesarean section deliveries ¹⁴. Similarly Dr Gupta Priyanka Rohit et al study showed that significant no of patients underwent vaginal delivery (69.48) and only few of the referred patients have been taken for LSCS (22.75%). Commonest indication of LSCS in both the studies being the fetal distress ¹⁷. In a study by Jyoti Bindal et al out of total referred cases, 27.9% of cases underwent caesarean section and 48% delivered vaginally²¹. Study by Nagar N et al showed 64.05% patients referred underwent vaginal delivery includes both high and low risk patients. 24.5% patients had undergone LSCS and 4.72% patients were managed conservatively. Decreased rates of caesarean section was seen in the above studies because of proper maintenance of partograph, trial of labour and expectant management was practised. Also these studies reported less referral cases of obstructed and prolonged labour.

Present study demonstrates most common maternal complication to be postpartum hemorrhage 22.8%, followed by wound dehiscence and birth canal injuries constituting 21.8% and 20.8% cases respectively. [Table 9] whereas Sanju Aggarwal et al in her study reported most common postpartum complication being

wound gapping (3.4%), followed by PPH and RTI³¹. In the study by Rekha Jakhar et al the important causes of maternal morbidity were anaemia (51.09%), postpartum eclampsia (3.27%), PPH (18.20%) and infection (4.07%) i.e. wound infection, sepsis and lower respiratory infections; and APE (20.77%). The primary reason for PPH and wound dehiscence being the most common maternal complication as large number of patients were admitted with a diagnosis obstructed labour with mild to moderate degree of anaemia in our study.

Rate of ICU admission was low in this present study (1.7%) [Table 24] compared to studies by Rekha Jakhar et al where, out of all 1,014 cases, there were 183 (5.3%) ICU admissions. Jyoti Bindal et al In this study, 910 (17.4%) cases admitted to obstetric ICU. Divya Goswami et al found that 19 patients (8.02%) needed ICU admission. Maskey S et al conducted a prospective observational study reviewed 112 obstetric cases referred from various centres. 27% of patients were in serious or critical condition on arrival, 52% patients required surgical intervention, 19% received intensive care management^{19,21}.

Rathi Charu et al (2010) in their study reported ICU care in 8% cases Nazam R et al Out of 2469 patients, 11.5% patients needed ICU admissions and 5.42 needed ventilator care. Mariem Ghardallou et al documented 32 women were admitted to the intensive care unit (ICU) for hypertension related complications or haemorrhage¹⁴. Study by Goswami and Makhija showed that 12.34% of referred patients required an ICU admissions with an average stay of 4.26 days. The cause behind low ICU admission in this present study is unavailability of ICU bed as in our institute have only 20 beds are for all the departments of the hospital.

In our study rate of maternal death occurred in 18 cases (0.7%) which is similar to the finding by Rekha Jakhar et al who reported 0.9% maternal deaths. The most important cause was haemorrhagic shock due to PPH. In these cases, the associated factors were septicaemia, DIC and severe anaemia.

Higher rates of maternal deaths compared to our study was found in study conducted by Jyotsana et al. showed 5% maternal deaths were reported during the study period. DIC and postpartum hemorrhage in patients of eclampsia constitute leading cause of maternal death amongst referred cases²⁵. Gupta et al. reported 40 (2.72%) of mortalities in their study. Similarly Sharma S et al, reported 1.55% mortalities in their study¹⁶. Jyoti Bindal et al reported maternal deaths in 114 cases (2.2%)²¹. Maskey S et al found in their study that maternal deaths occurred in 2 cases (1.8%). Rathi Charu et al (2010) in their study reported maternal mortality of 7 out of 100.. Gadhiali et al reported 1.2% maternal

mortality, Nazam R et al 3.8% and Panchal and Patel reported 2% maternal mortality in her study.

Less number of maternal deaths was seen in our study because less phase 2 and phase 3 delay, immediate specialist care, timely decision, blood transfusion facility and proper care at ICU. The leading causes of maternal mortality is hypertensive disorders followed by obstetric haemorrhage, DIC and severe anaemia.[Table 10]

Live birth rate in our study is 95.9% [Table 11] which is similar to studies by Mariem Ghardallou et al. 98.2% of babies were born alive and 1.8% were still born¹⁴. Similar study by Rathi Charu et al reported 90% of births were live births while 9.09% were stillbirths. All the stillborn babies were pre term. Also Khatoon A et al. had in their study reported total number of live births 87% still births 13% and 26.5% preterm births. Proper delivery methods, timely decision for caesarean section, immediate neonatal resuscitation following delivery and proper NICU care has been the cause of higher rates of live births in our study⁴².

Lower live birth rate compared to our study was seen in the study by Jyotsana et al. showed that out of 57% normal delivered 45.6% newborns were alive and healthy, 19.2% were stillborn, 12.2% died, Surabhi Sharma et al reported 74.01% live births, 25.98% still births in her study²⁵. Nazam R et al showed that out of 1680 deliveries 584 (34.7%) were stillborn & 1096 (65.2%) were live births. Dr Gupta Priyanka Rohit et al 10.85% babies were still births and 15.36% preterm. Birth asphyxia contributes 6.49% and sepsis 2.95%¹⁷. Devineni et al total number of live births were 73 (78.5%). Thus in these studies live birth rate is lower compared to our study. The prime reason for lower rates of live births is improper management of labour like in judicious application of ventouse and forceps. Delay in neonatal resuscitation and NICU referral also contribute to higher rates of neonatal deaths.

APGAR score of <7 at 1 min was found in 16.2% in our study [Table 26] which is comparable with the study by Amina S. Gonied (2011) observed that babies of unbooked mothers were twice as likely as booked mothers to have asphyxia as indicated by an Apgar score of <7 at one minute (35%, 16.5%, respectively) and at five minutes (18.7%, 8.2%, respectively)⁶².

Higher percentage of APGAR score <7 than our study was seen in Umesh Sabale et al. study which documented 52.60% of babies had 1 min APGAR score 6 or less & 9.83% babies had apgar score 6 or less at 5 min⁶. Divya Goswami et al reported of the 92 live birth, 27(29.3%) had 1 minute APGAR Score <7. The reason being

more cases of obstructed labour and fetal distress cases were documented in these studies¹⁹.

Lower percentage of APGAR score <7 than our study was seen in study by Sanju Aggarwal et al documented Apgar score < 7 seen in 4.4% in booked cases and 12.4% in unbooked cases as the percentage of booked cases was more³¹. Total NICU referral in the present study is 25.7%. [Table 13] Similar rate of NICU admission was seen in study by Sanju Aggarwal et al where NICU admission was seen in 24.4% in booked cases and 51.4% in unbooked cases ($p < 0.001$). Nagar N et al reported 22.67% needed NICU admission in booked cases³¹.

Higher rates of NICU admission than our study was found in the studies conducted by Heera Shenoy et al. who reported 68% of babies needed NICU admissions similar to the report of 62.3% by Rathi et al. Jyotsana et al 31.5% had NICU admission and 68.4% were discharged well²⁵. Devineni et al 28 cases (30%) required neonatal admission and 5 (5.3%) had early neonatal death. Nazam R et al Out of there live births 812 (74%) needed NICU admission and 209 (25.7%) went in to neonatal ventilator. Higher rates of NICU admissions in these studies was seen as the number of premature births and low birth weight babies were more.

Lower rates of NICU admission than our study was found in the studies conducted by Mariem Ghardallou et al. A total of 46 (9.3%) newborn infants required admission to the neonatal ICU. Similarly Umesh Sabale et al total NICU admission rate was 14.36%. Dr Gupta Priyanka Rohit et al Total NICU admission rate was 10.56%. Lower rates of NICU admission was seen in these studies as incidence of premature births were less in these studies^{6,14,17}.

Present study shows that perinatal complication birth asphyxia was seen in 28.9% cases out of total liveborn babies, followed by respiratory distress syndrome (27.4%) and jaundice of newborn (14.7%). Birth injuries were found to be in 7.9% cases and intracranial hemorrhage in 5.7% cases. Least common complications being seizure, HDN, IUGR, congenital anomaly and perinatal infection in 4%, 3%, 3%, 3% and 2% cases respectively. [Table 14] which is similar to study by Rathi Charu et al who reported of those neonates requiring nursery care, 56.25% were 28-32 weeks of gestation at birth while 55% of those roomed in were 37 weeks or more at the time of birth. 26% of all live born had respiratory distress, 24% had necrotizing enterocolitis, 14% had neonatal hyperbilirubinaemia and 9% had septicaemia.

Sanju Aggarwal et al In unbooked cases 59.8% babies delivered were term, 40.2% preterm and in booked cases 87.6% babies delivered were term, 12.4%

preterm. Out of 1000 cases studied meconium stained liquor seen in 1.4% in booked cases and 3.8% in unbooked cases³¹.

Nagar N et al 72.33% babies were delivered vaginally and 27.67% babies by LSCS. Among vaginal deliveries 78.37% babies were alive and healthy, 11.5% needed NICU admission, 4% were early neonatal deaths and 6.13% babies were stillborn. Among LSCS deliveries 66.995 babies were alive and healthy, 22.67% needed NICU admission, 6.21% were early neonatal deaths and 3.93% babies were stillborn.

Heera Shenoy et al. reported 104 (77%) singletons and 30 (22%) were multifetal gestation babies. Majority of babies of obstetric referrals were preterm (72%) while 28% were term. Survival rate of babies in her study was 84.5% due to the state-of-the-art Neonatal care facilities.

Perinatal mortality was found to be 10.4% in our present study, which is similar to study by [Table 15] Sanju Aggarwal et al reported intrauterine fetal death in 1% in booked group and 9% in unbooked group, early neonatal death was seen in 5.4% in booked group and 11.8% in unbooked group ($p < 0.001$)³¹.

Higher rates of perinatal mortality compared to our study was seen in studies conducted by Dr Gupta Priyanka Rohit et al in her study reported perinatal mortality rate to be 14.1%¹⁷. Rathi et al also reported 75% of neonatal deaths occurred in pre term neonates and perinatal mortality of 28.23%. Similarly⁶ Umesh Sabale et al, Khatoon A et al., Gadhiali et al Surabhi Sharma et al Adhikari and sanghamitra reported perinatal mortality 15.5%, 41%, 28.20%, 30.63% and 43.27% in their studies respectively⁴². Higher percentage of perinatal mortality was seen in the above studies because referral cases of obstructed labour, fetal distress and premature labour were more.

CONCLUSION

Referral is a coordinated movement of healthcare seekers through the health system to reach a high level of care in a small and often fatal window of time. It involves factors like, decision to seek the healthcare and the perception of risk by the women herself and her family members, ease in reaching health facility, financial stability, identification of high risk factors by health personnel and timely decision about intervention and referral.

Illiteracy and ignorance of female regarding healthcare requirements and unavailability of proper healthcare facilities in the reason came out to be a major contributor of poor pregnancy outcome.

In order to decrease the number of unnecessary referrals and to reduce burden on tertiary care hospitals, healthcare workers should be trained in essential and emergency obstetric care which will help in reducing morbidity and mortality. Timely referral is crucial for a satisfactory maternal and fetal outcome. All peripheral health sectors should be well equipped with vehicles on road transport facility.

Lack of blood bank facility is another hurdle in ensuring a satisfactory maternal outcome. We must give emphasis on correction of anaemia in ANC care, so that the woman can bear the loss during delivery. This can be achieved by measures like iron supplementation to adolescent girls, early ANC registration of pregnant women, deworming and educating women about contraception and birth spacing.

For women empowerment and their better status, we need to change the mind-set of society. Economic independence will increase her decision making power and enhance her position in household. This will also help her to interact with the outside world and be aware of services available to them.

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.

Every woman has right to get good quality healthcare and now it is high time to update our practice of maternal and child health (MCH) care services, because there was a challenge of Millennium development by 2015, which still remains a challenge.

BIBLIOGRAPHY

1. Nabila Clydea Harahap, Putu Wuri Handayani, Achmad Nizar Hidayanto. Barriers and technologies of maternal and neonatal referral system in developing countries: A narrative review. *Informatics in Medicine Unlocked* 15 (2019) 100184
2. <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality> [google]
3. Jakhar R, Choudhary A. Study of maternal outcome in referral obstetric cases in a tertiary care centre. *J Family Med Prim Care* 2019;8:2814-9.
4. <https://www.who.int/southeastasia/news/detail/10-06-2018-india-has-achieved-groundbreaking-success-in-reducing-maternal-mortality> [google]

5. <https://www.google.com/amp/s/thewire.in/health/maternal-mortality-ratio-india-decline/amp/> [google]
6. Umesh Sabale 6, Alka Murlidhar Patankar. "Study of Maternal and Perinatal Outcome in Referred Obstetrics Cases". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 26, March 30; Page: 4448-4455, DOI: 10.14260/jemds/2015/643
7. Bossyns P and Van Lerberghe W, 2004, The weakest link: competence and prestige a constraints to referral by isolated nurses in rural Niger, in Human Resources for Health 2004, 2-1, available on line at: <http://www.human-resources-health.com/content/pdf/1478-4491-2-1.pdf>
8. Cervantes K, Salgado R, Choi M and Kalter H. 2003 Rapid Assessment of Referral Care Systems: A Guide for Program Managers, published by the Basic Support for Institutionalizing Child Survival Project (BASICS II) for the United States Agency for International Development, Arlington, Virginia, available on line at: <http://www.jsi.com/Managed/Docs/Publications/WomensHealth/PNACW615.pdf>
9. Department of Health, Republic of South Africa, 2003, The Clinic Supervisor's Manual, Version 3, see Section 6: Referral System Guidelines, available on line at: <http://www.doh.gov.za/docs/factsheets/guidelines/clinical/index.html>
10. Department of Reproductive Health and Research (RHR), World Health Organization, Care of mother and bay at the health centre: A practical guide, see Section 3 Developing and maintaining a functioning referral system, available on line at: http://www.who.int/reproductivehealth/publications/msm_94_2/care_mother_baby_health_centre.pdf
11. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. Social Science & Medicine. 1994 Apr;38(8):1091-110.
12. Anil Kumar G, Shweta T, Sudip B, Amarjeet S. Health System Strengthening- Focussing on Referrals: An Analysis from India. JOJ Nurse Health Care. 2017; 2(4): 555592.
13. Toolkit. Operating Perinatal Referral Transport Services in Rural India. United Nations Children's Fund (UNICEF) 2010. Chapter 2.3,3,4
14. Mariem Ghardallou^{1,2}, Manel Limam¹, Abdejelil Khelifi^{2,3}, Ons Khairi¹, Hédi Khairi^{2,3}, Ali Mtiraoui^{1,2}, Thouraya NabliAjmi^{1,2}. Obstetric referrals to a tertiary care maternity: a descriptive study Pan African Medical Journal. 2019;33:306. doi:10.11604/pamj.2019.33.306. 16906

15. Patel RV, Pandya VM, Patel DB, Shah HD. Multiparametric study of obstetric and gynaecological emergency cases referred to a tertiary care centre. *Indian J Med Res Pharm Sci* 2015;2:14- 20.
16. Sharma S. Evaluation of referred obstetric cases. A thesis submitted to the devihilya vishwavidyalaya, Indore as partial fulfillment for the degree of M.S. (Obstetrics and Gynaecology) 2007.
17. Gupta PR, Gupta PR, Chaudhari SN, Gonnade NV. Maternal and fetal outcome in referred patients to tertiary care center. *Sch J App Med Sci* 2016;4:1624- 31.
18. Puri Alka, Yadav Indra, Jain Nisha; Maternal Mortality in an Urban Tertiary Care Hospital of North India. *J Obstet. Gynaecol. India.* 2011; 61(3): 280–285.
19. Divya Goswami, Makhija A; a study of high risk obstetric referrals to tertiary care hospital in Garhwal, Uttarakhand. *IJSR* oct 2015, vol4, issue 10.
20. Patel HC, Singh BB, Moitra M, Kantharia SL. Obstetric Referrals: Scenario at a Primary Health Centre in Gujarat. *Natl J Community Med.* 2012; 3(4):711-4.
21. Jyoti Bindal¹, Nidhi Agrawal^{2*}, Dharmesh Chandra Sharma³ Overview of Referred Obstetric Patients and Their Outcome in Tertiary Care Hospital *JMSCR* Vol||05||Issue||05||Page 22485-22491||May DOI: <https://dx.doi.org/10.18535/jmscr/v5i5.196>
22. Swain S, Prakash A. Utilisation of referral services by high risk pregnant population in rural Varanasi. *Indian J Matern Child Health* 1992 Jul-Sep; 3 (3):74-6.
23. Devineni K, Sodumu N. A study of spectrum of referral pattern at a tertiary teaching hospital towards better obstetric care. *IAIM* 2016;3:193- 8.
24. Shenoy HT, Shenoy S. Inter-hospital obstetric referrals: public versus private sector to a tertiary care teaching hospital in South Kerala, India. *Int. J. Reprod Contracept Obstet. Gynecol.* 2019; 8:xxx-xx.
25. Jyotsana*, Lalit D. Kapadia, Hafsa Vohra Study of maternal and perinatal outcome of referred patients in tertiary health centre *Int. J. Reprod Contracept Obstet. Gynecol.* 2017 Dec;6(12):5363-5367 www.ijrcog.org
26. Morsheda B, Shamsun N, Hashima EN. Assessing the MANOSHI referral system addressing delays in seeking emergency obstetric care in Dhaka's Slums. *MANOSHI Working Paper Series Manoshi- WP10:1-36* published by ICDDR, B, BRAC 2010:10.
27. Nagar N. Gupta P. Maternal and foetal outcome in patients referred to tertiary hospital. *Obg Rev. J obstet. and gynecol.* 2019;5(1);37-44.doi;10 17511/jobg 2019.i1.08.

28. Dr. Shivani Badal¹, Dr. Gaurav Acharya*² and Prof. L. Ranjit Singh³ pattern of term obstetric emergencies referred from health centers to rims ejpmr, 2017,4(8), 376-382
29. Gadhiali MV, Lenya NR, Shankhalkar PC. Paper read in 24th AICOG, Chandigarh, December 1980.
30. Limaye HR. Maternal and fetal outcome in obstetric emergency cases referred from rural areas. J Obstet. Gynecol. India 1982; 32: 520-529.
31. Sanju aggarwal et al. To study the maternal and perinatal outcome in booked versus unbooked patients. European journal of pharmaceutical and medical research. Ejpmr, 2017,4(3), 308-312.
32. Heera Shenoy T, Mammen KE. Pattern of obstetric referrals in a tertiary hospital in South Kerala. J. Evid. Based Med. Healthc. 2018; 5(29), 2180-2183. DOI: 10.18410/jebmh/2018/451
33. Najam R, Gupta S, Chowdhury H. Pattern of obstetrical emergencies and fetal outcomes in a tertiary care center. Acta Medica International. 2015;2(1):105-110.
34. Charu R, Gajria K, Soni N. Review of referred obstetric cases maternal and perinatal outcome. Bombay Hospital J 2010;52:1091-3.
35. Bhaskar Rao K. Vesicovaginal fistula: A study of 269 cases. J Obstet. Gynecol. India 1972; 22(5): 536-541.
36. Vinayak NM, Panditrao SK, Ramkrishna MA. Critical study of referrals in obstetric emergencies. J Obstet. Gynaecol. India 2004;54:258-259.
37. Wahane AR, Koranna PS. An analysis of maternal deaths in a tertiary care centre. Journal of Evolution of Medical and Dental Sciences 2014;3(31):8646-8652.
38. Mughal S, Rathee S, Malik S. Birth practices in rural Haryana and urban Haryana. J Obstet Gynecol India 1990; 40: 742-45.
39. Farzana Aamir, Atiya Fasih, Asha Mahesh, Emmanuel Qamar Charles. A comparative review of maternal morbidity and perinatal outcome in booked and un-booked mothers. Pak J Surg 2012; 28(4):280-284
40. Owolabi A T, Fatusi A O, Adeyemi A, Fatureti S O, Obiajuwa P O . Maternal complications and perinatal outcomes in booked and unbooked Nigerian mothers. Singapore Med J. 2008; 49{7}:526-531
41. Thaker R, Deliwala K, Jadav MM. Retrospective comparative study of obstetric complications and maternal mortality in registered and unregistered women at tertiary care hospital. NHL J Med Sci 2013;2:28- 35.

42. Khatoon A, Hasny SF, Irshad S, Ansari J; An audit of obstetrics referrals to Abbasi Shaheed Hospital. *Pak J Surg.* 2011; 27(4): 304-8.
43. Panchal V, Patel S. Study of maternal and fetal outcome of patients referred in third trimester of pregnancy at tertiary care hospital. *Sch J App Sci* 2015;3:2449- 52.
44. Mitra J, Maitra TK. *J of O and G India* 1971; 21 :315
45. Sakhare AP, Thakare P; Outcome of caesarean delivery in rural obstetric referrals, 51st Conference AICOG, 2008.
46. Dr. Karmela Kujur. "A Prospective Observational Study of Maternal and Perinatal Outcome of Referred Patients in Tertiary Care Health Centre." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 1, 2019, pp 61-66.
47. Onwudiegwu U, Orji EO, Ogunlola IO, Brought-in maternal deaths in south-west Nigeria. *J Obstet. Gynecol.* 2002 jul; 22(4):385-8. DOI:10.1080/01443610220141326.[pubmed]
48. Narsaria K, Mukhopadhaya P, Kyal A, Agarwal K, Agarwal A, Sanghi S. Study of obstetric referrals -one year experience at a tertiary care centre in West Bengal HECS. *Int J Com Health Med Res.* 2017;3(3):32-6.
49. Alehagen SA, Finnstrom O, Hermansson GV, Somasundaram KV, Bangal VB, Patil A, et al. Nurse-based antenatal and child health care in rural India, implementation and effects-an Indian-Swedish collaboration. *Rural Remote Heal.* 2012;12(3):2140.
50. Ohn HT, Patrick DC, Zaw W, Mary K, Hnin YK, Herni B. Inter-hospital emergency obstetric referrals to the labour ward of RIPAS Hospital Brunei. *Int Med J.* 2011;7(1):22-33.
51. Hitesh J. Perceptions and constraints of pregnancy related referrals in rural Rajasthan. *J Fam Welfare.* 1996;42(1):24-9.
52. Chaturvedi S, Randive B, Diwan V, De Costa A. Quality of obstetric referral services in India's JSY cash transfer programme for institutional births: a study from Madhya Pradesh province. *PloS One.* 2014;9(5):e96773.
53. UNFPA. Concurrent assessment of Janani Suraksha Yojana (JSY) in selected states: Bihar, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh. New Delhi: UNFPA- India; 2011.
54. Sørbye KI, Vangen S, Oneko O, Sundby J, Bergsjø P; *BMC Pregnancy and Childbirth* . Caesarean section among referred and self-referred birthing women: a cohort study from a tertiary hospital, north eastern Tanzania. 2011; 11(55).

55. Ambreen A, Khurshid S, Khurshid M, Khan F, Intisar A. Obstetric outcome of cases referred to a tertiary care hospital after trial of labour. *Annals.* 2012;18(1):71-80.
56. Ayesha; An audit of obstetrics referrals to Abbasi shaded hospital: *Pak. Journal surgery,* 2011: 27(4): 304-308.
57. Konar Hiralal, Chakraborty Asit Baran; Maternal mortality: A FOGSI study (Based on institutional data); *Journal of obstetrics and gynaecology of India,* march-april 2013, 63(2): 88-95.
58. Maskey S., Obstetric referrals to a tertiary teaching hospital of Nepal. *NJOG* 2015 Jan-Jun; 19 (1):52-56.
59. Begum S, Aziz-un-Nisa I; Analysis of maternal mortality in a tertiary care hospital to determine causes and preventable factors. *J Ayub Med Coll Abbottabad.* 2003; 15(2):49-52.
60. Borchert M, Goufodji S, Alihonou E, Delvaux T, Saizonou J, Kanhonou L, Filippi V; Can hospital audit teams identify case management problems, analyse their causes, identify and implement improvements? A cross-sectional process evaluation of obstetric near-miss case reviews in Benin *BMC Pregnancy Childbirth.* 2012; 12: 109.
61. Dilpreet Kaur, Vaneet Kaur, Veronica IY; Alarming High mortality in 21st Century. *JK Science.* 2007; 9(3):123-6.
62. Amina S. Gonied: Maternal Complications and Perinatal Outcomes in Booked and Unbooked Mothers *Journal of American Science,* 2011; 7(10).
63. Self A, Kennedy SH (2013) Why Are Women Dying When They Reach Hospital on Time? A Systematic Review of the 'Third Delay'. *PLoS ONE* 8(5): e63846. doi:10.1371/journal.pone.0063846
64. S. Adhikari, M Dasgupta, M Sanghamita; Management of obstructed labour: a retrospective study. *J Obstet. Gynecol. India* 2005; 55(1): 48-51.