

Multifetal pregnancy: maternal and neonatal outcome

Abstract

Multiple pregnancy is simultaneous development of more than one fetus in uterus. Multifetal gestations also are associated with significantly higher maternal morbidity and associated health care costs. Women with multiple gestations are nearly 6 times more likely to be hospitalized with complications, including preeclampsia, preterm labor, preterm premature rupture of membranes, placental abruption, pyelonephritis, and postpartum hemorrhage.

Aim and objectives: To find out incidence of multifetal pregnancies, and frequency of preterm births and low birth weight. To find out correlation of parity and the incidence of different modes of delivery in multifetal pregnancy. To study the complication multifetal pregnancy and the neonatal outcome.

Materials and methods: Patients with multifetal gestation were studied over a period of 2 years in a tertiary health care centre.

Observations: These were recorded as per the proforma. It is determined that, prematurity was the most common complication among the multiple pregnancies, in both twins (49.60%) and triplets. Followed by 6.13% of the twins with intrauterine fetal death, 3.906% twins having polyhydroamnios, 1.562% having congenital anomaly like hydrocephalus, and other neural tube defects, 1.986% twins had IUGR. Among the maternal risks in multiple pregnancy, the majority of patients developed preterm labour (48.461%) and 14.615% developed PIH, 11.538% patients had PROM, Polyhydroamnios was present in 3.846% patients, 1.538% patients had abruption, 1.538% patients had PPH, 3.706% of patients were hypothyroid, amongst others included one case of Heart disease, Autoimmune hepatitis, HEV positive, HBs Ag positive and tubercular pleural effusion each. The outcome of all the 128 cases of twins and 2 cases of triplets were studied in detail. Of which 70 patients presented in labour and 50 patients were admitted in hospital as high risk pregnancies

Conclusion: Our study highlighted the importance of antenatal care playing a major role in the final outcome of multiple pregnancy. Also the age at which the patient conceived, for this multiple gestation and the parity for the present multiple gestations reflected the socioeconomic status and awareness among the patients.

Keywords: twins, triplets, ovulation induction, multifetal pregnancy, preterm delivery

Abbreviations: DIC, disseminated intravascular coagulation; ECV, external cephalic version; FSH, follicular stimulating hormone; GDM, gestational diabetes mellitus; IUD, intrauterine death; IUGR, intrauterine growth restriction; IVF, *in vitro* fertilization; LSCS, lower segment cesarean section; NICU, neonatal intensive care unit; PET, pre eclamptic toxemia; PIH, pregnancy induced hypertension; PPH, postpartum hemorrhage; PROM, premature rupture of membrane; TTT, twin to twin transfusion syndrome; U/A, uterine artery; USG, ultrasonography

Introduction

Multiple pregnancies are simultaneous development of more than one fetus in uterus. Simultaneous development of two fetuses in uterus is called as twins and that of three is triplets and quadruplets, pentuplets, and so on... depending on the number of fetuses. Historically, only 1% of all pregnancies are twin pregnancy, indicating that by nature, human reproduction is programmed to carry and nurture only one fetus at a time.¹ Multiple gestation is a mixed blessing and if successful allows a couple to rapidly expand their family with a minimum number of pregnancies. It has aroused curiosity, reverence and even cruelty since ancient times.² The study of twins and the phenomenology of twinning is called GEMELLOLOGY.³ Multiple

pregnancy has always been a subject of interest to obstetricians and paediatricians alike. Since 1980, there has been 65% increase in the frequency of twins and a 500% increase in triplet and higher order births.⁴ Multifetal gestations also are associated with significantly higher maternal morbidity and associated health care costs. Women with multiple gestations are nearly 6 times more likely to be hospitalized with complications, including preeclampsia, preterm labor, preterm premature rupture of membranes, placental abruption, pyelonephritis, and postpartum hemorrhage.⁵ More frequent and serious complication increases as the number of foetus increase. With the advent of superovulation and assisted conception the incidence of multiple pregnancy increases. It contributes disproportionately to perinatal mortality rate. So vigilant antenatal and intrapartum care is needed. Success of treatment results from better understanding, early diagnosis, foetal surveillance, counselling, skill and timely intervention.

Materials and methods

This was a prospective study of multiple pregnancies over a period of 2 years. All patients with multiple pregnancies delivered at our hospital were included in the study. A thorough history of patient with chief complaints was recorded. Detailed menstrual history, obstetric

histories were noted down along with family history of multiple pregnancies if any was recorded. History of ovulation induction drugs like clomiphene etc was recorded. General examination and systemic examination was done. Obstetric complication like PIH, anaemia, preterm labour, IUGR, PROM was noted. All the patients presenting in labour with gestation of more than 28 weeks were included in the study. Outcome was recorded as number of patients who delivered spontaneously vaginally, requiring instrumentation and also those who required caesarean section. All the complications related to multiple pregnancies were noted down. Fetal outcome in view of gestational age at birth, weight at birth, APGAR score at 1 minute, requirement for NICU admission was analyzed. Among the first coming fetus was labeled as twin 1 and the second coming fetus was labeled twin 2 as for triplets the fetuses were labeled as fetus 1, fetus 2, fetus 3 for consecutive deliveries of triplet fetuses. Special emphasis was given to second baby of the twin regarding presentation, time required for the delivery, mode of delivery and neonatal morbidity. Maternal parameters studied were Age, Parity, Family history of multiple pregnancies, History of infertility treatment or ovulation induction, Antenatal registration and referred cases, Antenatal high risk factors, maternal complications in labour, specific treatment given for such complications, Ultrasound reports. Fetal parameters studied were Gestational age at birth, Weight at birth, Diagnosis, Mode of delivery, NICU admission (morbidity).

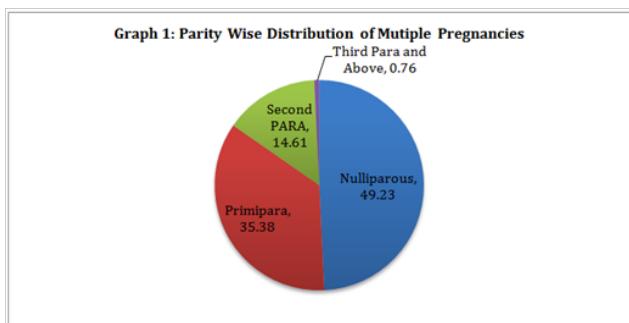
Results

There were 130 multiple deliveries amongst 9443 total deliveries in the specified time period out of which 128 were twin pregnancies and 2 were triplet pregnancies. The incidence in our hospital is 1.37 %. The following results were analyzed at the end of the study (Table 1).

Table 1 Age wise distribution of multiple pregnancies

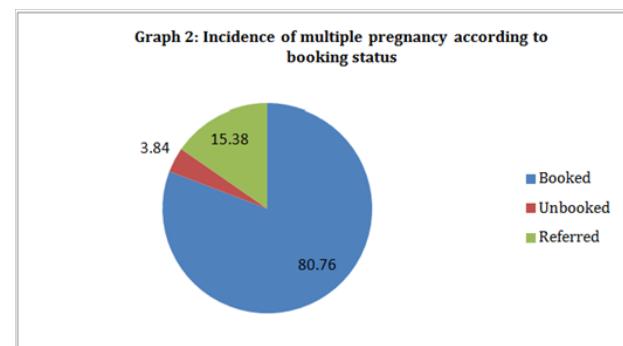
Age (years)	No of patients(N)	Percentage (%)
<20	7	2.3
20–30	113	90.76
31–39	8	6.15
>40	1	0.76
TOTAL	130	100

From Table 1 we found that the age group of 20 - 30 years to be the majority in our study. The increased incidence of multiple pregnancies with increasing age has been well demonstrated in various studies (Graph 1).



Graph 1 Parity wise distribution of patients with multiple pregnancies.

In our study, maximum number of patients were primipara who had first parity of multiple pregnancy (49.23 %) followed by those with second parity (35.38 %) and third parity (14.61%) and least number of patients belonged to third para and above (0.76 %) (Graph 2).

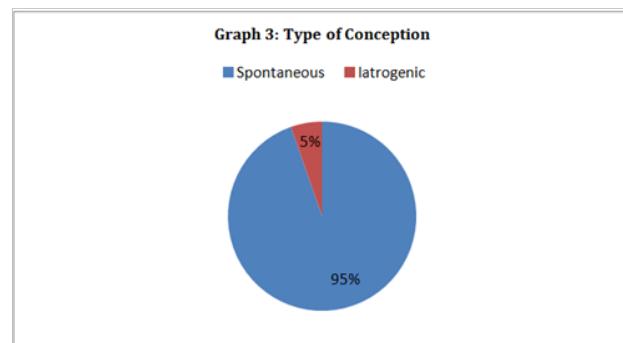


Graph 2 Incidence of multiple pregnancies according to booking status.

In this study 105 (80.76 %) cases were booked cases, 20 (15.38 %) were referred to our institute as high risk cases and 5 (3.84 %) were unbooked cases.

Etiological factors

Our study evaluated the role of factors like ovulation induction agents for treatment of infertility in relation to multiple pregnancies which can be labeled as iatrogenic multiple pregnancies (Graph 3).

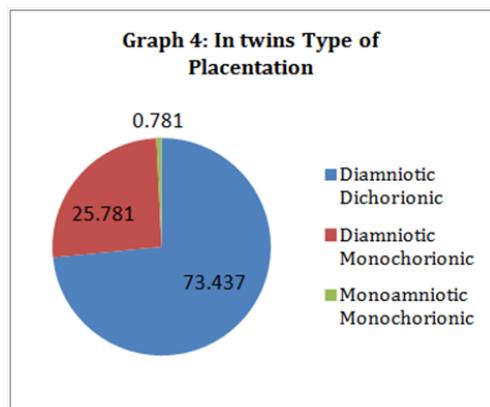
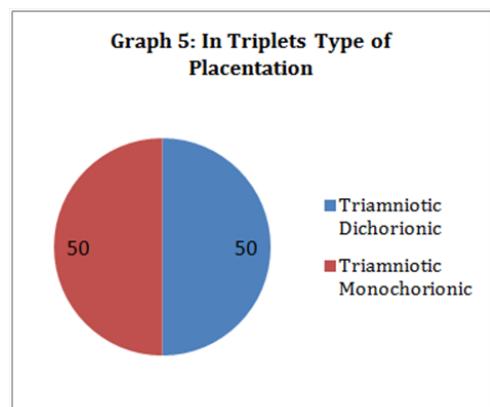


Graph 3 Type of conception.

Thus out of our 130 patients majority had an spontaneous conception of multiple pregnancy (94.615 %) followed by patients with ovulation induction drugs (5.384 %) the drug used being Clomiphene citrate in all these patients. The role of race could not be evaluated as our study was of single population in a well defined geographic area. 3 Patients had family history of twin pregnancy, 1 patient had history of previous twin pregnancy, 2 patients had history of periconceptional folic acid treatment, none of the patients gave history of cigarette smoking.

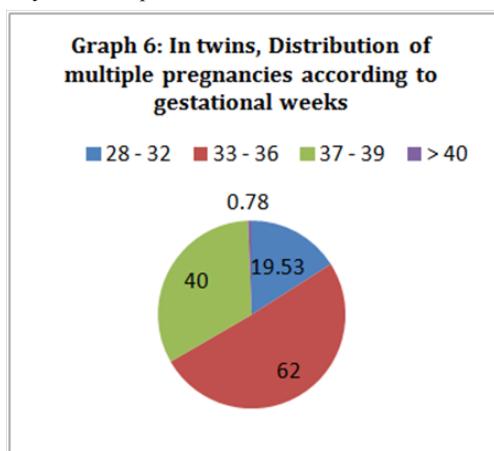
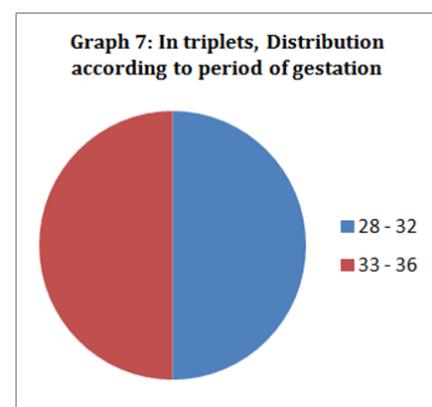
Type of placentation (Graph 4) & (Graph 5)

It can thus be inferred from the graph that the most common type of placentation among twin pregnancies was diamniotic dichorionic (72.307%) followed by diamniotic monochorionic (25.384%) and the monoamniotic monochorionic being the least common (0.769%). Among triplets one had triamniotic dichorionic and other one had triamniotic monochorionic.

**Graph 4** Twins type of placenta.**Graph 5** Triplets type of placenta.

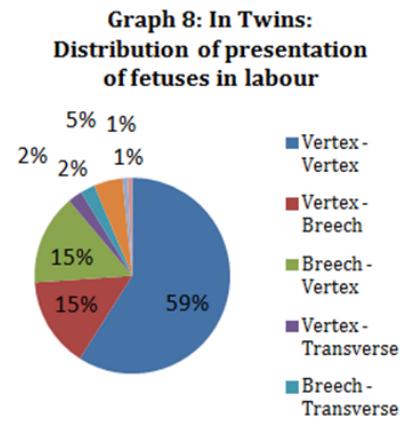
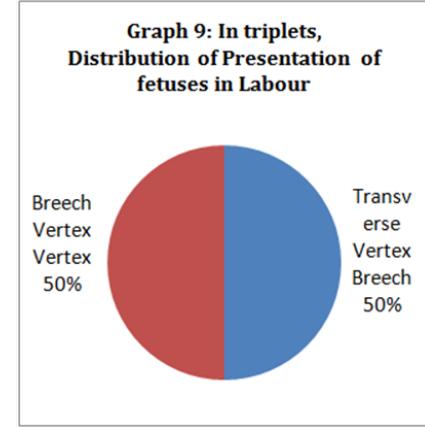
Distribution of multiple pregnancies according to gestational weeks (Graph 6) & (Graph 7)

From the above graph most of the twins are delivered between 33-36 weeks (48.437%) and mean weeks of gestation was 35 weeks with standard deviation of 2.825. Thus in majority of multiple deliveries maximum number of patients delivered at less than 36 weeks (66.92%) which is earlier than singleton pregnancies. While triplets delivered prematurely one at 32 weeks and other at 34 weeks giving the prematurity rate of triplets.

**Graph 6** In twins, distribution of multiple pregnancies according to gestational weeks.**Graph 7** In triplets, distribution of multiple pregnancies according to gestational weeks.

Distribution of presentation of fetuses in labour (Graph 8) & (Graph 9)

In our study, from the above tables vertex-vertex presentation of the first coming and after coming twins were the most common presentation (57.812%), vertex-breech and breech-vertex being second most common, both occurring with equal frequency accounting for 4.687% followed by vertex-transverse and breech-transverse both occurring in 2.343 % cases followed by transverse-breech (1.52%), transverse-vertex (0.78%) and transverse-transverse (0.78%).

**Graph 8** In twins: distribution of presentation of fetuses in labour.**Graph 9** In triplets, distribution of presentation of fetuses in labour.

Mode of delivery in multiple pregnancies (Table 2) & (Table 3)

Table 2 Mode of delivery in multiple pregnancies in twins

Mode of delivery	Twin 1		Twin 2	
	N	%	N	%
Vaginal	68	53.125	64	50
LSCS	60	46.875	64	50
Total	128	100	128	100

Table 3 Mode of delivery in multiple pregnancies in triplets

Mode of delivery	Fetus 1	Fetus 2	Fetus 3
LSCS	2	2	2
Total	2	2	2

The twin pregnancies had maximum number of vaginal deliveries, Twin 1 (53.125%), Twin 2 (50%), and LSCS was required for 46.875% of twin1 and 50% of Twin 2. Among the triplets both sets required LSCS. The mode of delivery did not show much significant statistical difference (P value>0.05).

Distribution of weights of neonates of multiple pregnancies (Table 4) & (Table 5)

Table 4 Distribution of weights of neonates of multiple pregnancies in twins

Weight (Grams)	Twin 1		Twin 2	
	N	%	N	%
< 1000	3	2.343	8	6.25
1001–1500	21	16.41	18	14.06
1501–2000	46	35.94	52	40.625
2001–2500	50	39.062	38	29.687
>2500	8	6.25	12	9.375
Total	128	100	128	100

Table 5 Distribution of weights of neonates of multiple pregnancies in triplets

Weight	Fetus 1	Fetus 2	Fetus 3
<1000	1	0	1
1001–1500	1	1	0
1501–2000	0	1	1

Thus majority of the babies were between 2001-2500 grams amongst twin 1 (39.062%), followed by between 1501–2000 grams in twin 2 (40.065%). The mean for Twin 1 being 1929 grams with SD 0.4897, while the mean for twin 2 being 1868 grams with SD 0.5398. The triplets had very low birth weights owing to prematurity and overcrowding being higher order multiples. Using unpaired T test to find out whether there is significant difference in the weights between first and second twin we found no statistically significant difference (P>0.05) (Table 6).

P value 0.0001 significant. Of all 262 births of multiple pregnancies, there were 248 twin live births and out of 2 triplet deliveries, all 6 were live births. Amongst twins there were 8 intrauterine fetal death i.e. 8 still births. From the above table of results, we found significant requirement of NICU facilities for twin 2, and less frequent requirement

for twin 1, which is statistically significant (P value 0.0001). Our study has given special attention to the second of the twin delivery, for morbidity, and found the requirement of NICU facilities suggesting, the vigilant attention to be paid to the delivery of the second twin within the earliest time in order to prevent its morbidity compared to its first coming twin. The requirement of NICU admission was entirely dependent on the weeks of gestation, the APGAR score at 1 minute, weight of the baby and mode of delivery (Table 7).

Table 6 Distribution of neonates born out of multiple gestation for NICU admission after birth

Requirement of NICU admission	Twin 1		Twin 2	
	N	%	N	%
Needed	62	25	70	28.22
Not needed	62	25	54	42.18

Table 7 Neonatal risks for multiple pregnancies

Neonatal risks	N	%
Prematurity	126	49.606
IUD	8	6.153
TTT	1	0.781
Oligohydroamnios	1	0.781
Polyhydroamnios	5	3.906
Congenital anomaly	2	1.562
IUGR	5	1.986

Thus from the above Tables it is determined that, prematurity was the most common complication among the multiple pregnancies, in both twins (49.606%) and triplets. Followed by 6.13 % of the twins with intrauterine fetal death, 3.906% twins having polyhydroamnios, 1.562 % having congenital anomaly like hydrocephalus, and other neural tube defects, 1.986% twins had IUGR (Table 8).

Table 8 Distribution of maternal obstetrical problems in multiple pregnancies

Maternal risks	N	Percentage
Anemia	14	10.769
PIH	19	14.615
Hydramnios	5	3.846
Preterm Birth	63	48.461
PPH	2	1.538
Hypothyroidism	4	3.076
PROM	15	11.538
Abruptio	2	1.538
Others	5	3.846

Thus it is determined from the above table, that among the maternal risks in multiple pregnancy, the majority of patients developed preterm labour (48.461%) and 14.615% developed PIH, 11.538% patients had PROM, Polyhydroamnios was present in 3.846% patients, 1.538% patients had abruptio, 1.538% patients had PPH, 3.706% of patients were hypothyroid, amongst others included one case of Heart disease, Autoimmune hepatitis, HEV positive, HBsAg positive and tubercular pleural effusion each. There were no Maternal Mortalities (Table 9).

Table 9 Distribution for indication for LSCS amongst patients of multiple pregnancies

Indication	N	Percentage
Malpresentations	28	43.75
Fetal distress	10	15.625
Previous LSCS	7	10.937
Non progress of Labour	8	12.5
APH	2	3.125
Cord Prolapse	2	3.125

Thus, malpresentations in twins (43.75%) was the major indication for LSCS. The presence of breech or transverse lie of any of the fetuses increased the chances of LSCS. Followed by fetal distress (15.625%) and Non progress of labour accounting for 12.5% cases. Patients with Previous LSCS also accounted for 12.5% cases. Other indication being APH and cord prolapsed requiring LSCS in 3.125 % cases each (Table 10).

Table 10 Distribution of the time interval between delivery of fetuses of multiple pregnancies

Time Interval	N	Percentage (%)
<5 minutes	78	60
6–10 minutes	19	14.615
11–30 minutes	25	19.23
31–60 minutes	6	4.615
>1 hour minutes	2	1.538
Total	130	100

Thus, we determined from the above table that the maximum number of the fetuses was born within 5 minutes time interval.

Discussion

The frequency of multiple pregnancies in the past hundred years, has been 1.4-1.5%.⁶ In our hospital out of 9443 deliveries 128 were twin pregnancies. In our series the twin and triplet pregnancy rates were 1.355 % and 0.02 % respectively, the twin pregnancy rate is comparable with Smits J et al.⁷ who had twin pregnancy rate of 1.31%, while the triplet pregnancy rate of our series is comparable to the study by Erdemoglu et al.⁸ of 0.29%. The age distribution among multiple pregnancies, our series had the maximum number of patients in the age group of 20-30 years (90.76), which is comparable with Yuel et al.² (87.5%) and least number of pregnancies in age more than 40 years (0.76%) which is comparable with Kauppila et al.⁹ (1.1%). While a study by Satija et al.,¹⁰ found a strong association of maternal age with the twinning rate; the twinning rate for mothers between 30 and 34 years of age was about 10 times higher than the rate for mothers younger than 20 years. The distribution of multiple pregnancies with parity, it can be determined that in our series maximum number of patients had conceived as multiples for the first time, which is comparable to Yuel et al.² Whereas Satija et al.¹⁰ found that the twinning rate was highest at gestational order 4 or higher.

Most of the patients had conceived spontaneously in maximum number of our patients (94.62 %), which is comparable with Erdemoglu et al.⁸ (89.75 %) and Panwala et al.¹¹ (99.1%) had conceived spontaneously. According to the type of placentation, which was correlated with antenatal USG and inspection of placenta

and membranes after birth, the comparisons were made. Thus dichorionic placentation were the majority (73.44%) in our study, which is comparable with Erdemoglu et al.⁸ (69.3%) and Panwala et al.¹¹ (63.8%) Among the triplet pregnancy one was triamniotic monochorionic and other was triamniotic dichorionic. As compared to various authors, the average weeks of gestation are very similar and comparable with our study i.e 35 weeks, as the average weeks of gestation among twins being 36 weeks by Kauppila et al.⁹ and 33 weeks by Erdemoglu et al.⁸ and 34 weeks by Yuel et al.² So was the comparison with triplets and their average weeks of gestation, in our series was 33 weeks, while it was 32 weeks for Erdemoglu et al.⁸ Vertex-vertex presentation is most commonly seen in twins as is also in our series 57.8 %, that are comparable, with Panwala et al.¹² 51.4% . Although first presenting part being non vertex was most common indication for cesarean section among multiple pregnancies. The presentation of the fetuses during labour determined the route of delivery and operative interventions. It is determined in our study that, among twin pregnancies in labour 51.56 % delivered vaginally and 48.43 % required caesarean section, which is comparable with other studies, Yuel et al.² had 55 % vaginal deliveries and 45 % caesarean sections. In study by Erdemoglu et al.⁸ 50.5 % had vaginal deliveries and 45 % required caesarean section. In our study, since there was only 2 triplet pregnancy, both sets required caesarean section, showing high rate of LSCS is due to small sample size. Also it is specific in literature that birth with caesarean section is safer in nonvertex-vertex and nonvertex-nonvertex presentation cases. It is also known that fetal mortality is high in locked twin cases. The birth weight of twins in our study (Twin 1 1929grams, Twin 2 1868grams) were comparable to the birth weights found by Erdemoglu et al.⁸ (Twin 1 2100grams, Twin2 1900grams). There was no significant difference between the birth weights of twin 1 and that of twin 2 similar to studies by Erdemoglu et al.⁸ and Yuel et al.² The birth weight of twins in our study was significantly lower as compared to Kauppila et al.⁹ (Twin 1 2500grams, Twin 2 2500grams). This may be due to ineffective antenatal care, effective prolongation of pregnancies did not take place, resulting in early termination of pregnancy in the form of preterm labour. The twin 2 (28.22%) has greater percentage of NICU admission verses the twin 1 (25%) as seen on our study P value is significant which is comparable with Panwala et al.¹¹ (Twin 1 38.09% Twin 2 40.09%) and Kauppila et al.⁹ (twin 1 34.6%, Twin 2 42.8%) Overall NICU admission rates were lower in our study due to proper antenatal care and intrapartum monitoring. Premature births are very common in multiple pregnancy. Our series determined 49.006% of premature births. Which is comparable to the findings by Yuel et al.² (57.5%) and by Kauppila et al.⁹ (42%). All the 6 triplet babies were premature (100%). As compared to the series by Erdemoglu et al.⁸ 90.9%. Our study clearly shows that premature delivery is the main cause of fetal complications, like NICU admission for twins and triplets which finding is consistent with finding of other studies. Comparing the fetal risks, the percentage of prematurity was found to be very similar with other authors, as was the percentage of IUD among either of twins. The percentage of congenital anomalies was found to be 1.562% in our study, 0.5% in Yuel et al.² study and 10.6% in Erdemoglu et al.⁸ Multiple pregnancy is associated with an increase in obstetric complications such as premature birth, early rupture of membranes, pregnancy anaemia, PIH, antepartum, intrapartum postpartum bleeding. The most frequently seen obstetric problem in our series are determined as preterm birth 48.461%, PROM in 11.538 % Heart disease (0.783%) anaemia in 10.769% and other complications which are comparable with Erdemoglu et al.⁸ (PROM 14.36%, PPH 0.6%), while the incidence of viral hepatitis (1.538%) and PIH (14.615%) are comparable to Yuel et al.² (viral hepatitis 1.5 %, PIH 19%). In

comparison with the indications of LSCS for multiple pregnancy malpresentation (43.75%) is the commonest indication in our study which is comparable with Erdemoglu et al.⁸ (46.3%).

Summary

There is ample scope for active management of multiple pregnancies, both antenatally as well as postnatally. In multiple pregnancy, both mother and fetuses count. As both of them are at a higher risk of morbidity and mortality. Each patient of multiple pregnancy Presented with unique complication and hence, each of them were treated as different individual cases. Our study highlighted the importance of antenatal care playing a major role in the final outcome of multiple pregnancies. Also the age at which the patient conceived, for this multiple gestation and the parity for the present multiple gestations reflected the socioeconomic status and awareness among the patients. The role of antenatal registration among multiple pregnancies, as given in literature is more pronounced in our study too. 80.76 % of our patients were registered antenatally which concludes the importance of regular follow up for clinical status and prevention of complications. The most common being preterm birth and prematurity.

Regular follow up, along with prevention of preterm labour and adequate bed rest, and tocolysis helps in improving the neonatal outcome at birth and prevents neonatal NICU admissions and mortality. All patients with threatened preterm in between 28-34 weeks of gestation received 2 doses of Inj. betamethasone for fetal lung maturity. Our study detected the neonatal outcome of multiple pregnancies with special attention of one or both twins, in triplet pregnancy, the presentation of the fetuses prior to labour as well as in labour, and hence help in deciding the nature of delivery of the fetuses. Thought there were no maternal mortalities in our study, a strict watch on the maternal hemodynamic status was given. The most common complication in our study was PIH, followed by anaemia and PPH, which lead to adverse maternal outcome, can be prevented. The active and timely intervention during delivery and strict vigilance in the progress of labour, definitely improves maternal and perinatal outcome. The pros and cons of the mode of delivery should be weighed and individualized. Not all multiple pregnancies can deliver vaginally, as also not all of them can be delivered by caesarean section.

Conclusion

Here we conclude that there should be minimum delay in the delivery of second coming twin or triplets, to prevent long term effects of post natal complications in neonates like cerebral palsy as a result of cerebral hypoxia. In conclusion, though multiple pregnancies

is a high risk pregnancy for both mother and the fetus, majority of the risk factors are preventable for a better maternal and perinatal outcome. As the antenatal complications seen in multiple gestations are more common in higher order pregnancies, antenatal management is directed at reducing their incidence.

Acknowledgments

None.

Conflicts of interest

The authors declare there is no conflict of interests.

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