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Original Research Article

Obstetric and perinatal outcome of twin pregnancy: a prospective study in a tertiary care hospital in North India

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ABSTRACT

Background: Multiple pregnancy constitutes an important portion of high risk pregnancies and is a matter of grave concern to obstetricians and paediatricians owing to maternal and perinatal morbidity and mortality associated to it. Objective of present study was to evaluate maternal and perinatal outcome of twin pregnancy.

Methods: This observational study included 50 women with twin pregnancy with gestational age of 26 weeks or more. Maternal and perinatal outcomes were studied.

Results: The incidence of twin pregnancy was 2.8 % with maximum incidence in age group of 20 -29 years and in multigravida. Mean gestational age was 34.2 weeks. Vertex - vertex fetal presentation was most common presentation. Most frequent mode of delivery was cesarean section (54%). Preterm labour was most common maternal complication (74%), followed by anaemia (62%). Complications in perinatal period were birth hypoxia (58 %), intrauterine growth restriction (15 %), hyper-bilirubinemia (11%) and neonatal sepsis (10 %). 88% of the newborns were LBW. Perinatal mortality in our study was 17%.

Conclusions: Twin pregnancies are associated with significant maternal and perinatal morbidity which is more so for second twin. Effective antenatal care planned delivery and good pediatric facilities help decrease the complications. Management of twin pregnancy requires multidisciplinary approach and involvement of skilled obstetricians and paediatricians.

Keywords: Maternal morbidity, Preterm birth, Perinatal morbidity, Twin pregnancy

INTRODUCTION

Multiple pregnancy constitutes an important portion of high risk pregnancies and is a matter of grave concern to obstetricians and paediatricians owing to maternal and perinatal morbidity and mortality associated to it.

Twin pregnancies have increased rates of complications such as preeclampsia, antepartum and post-partum haemorrhage, anaemia, polyhydramnios, increased rate of cesarean section and preterm birth as compared to singleton pregnancies.¹⁻⁴ In addition, these pregnancies are prone to complications exclusive to twinning like

twin-twin transfusion syndrome, acardiac twins and conjoint twins. The worldwide incidence of multiple pregnancies varies around 2-20 per 1000 births.⁵ Highest burden of multiple pregnancies is seen in Sub-Saharan Africa, with average twinning rate of 20 per 1,000 deliveries as compared to 10 per 1,000 deliveries in Europe and around 5-6 per 1,000 deliveries in Asia.⁶⁻⁸ Since 1980, there has been 65% increase in the frequency of twins and a 500% increase in triplet and higher order births.⁹ The incidence of multiple pregnancies is increasing dramatically over a past few years owing to trend among women towards late childbearing and widespread use of assisted reproduction techniques. The

objective of this study was to evaluate the fetomaternal outcome of twin pregnancies at our hospital.

METHODS

This prospective observational study was conducted in the department of Obstetrics and Gynaecology of the hospital for a period of one year, between January 2017 to December 2017. Women with twin pregnancy with gestational age of 26 weeks or more admitted and delivered in the maternity ward of our hospital during the study period were included in the study. Patients discharged after taking conservative management were excluded from study. Twins requiring admissions in neonatal units were also followed up to their discharge. Detailed history of patients and their chief complaints was recorded. Age, parity, gestational age, menstrual history, obstetric histories were noted along with family history of multiple pregnancies if any. History of ovulation induction drugs /In Vitro fertilization (IVF) was asked. Obstetric complications like Pregnancy induced hypertension, anaemia, preterm labour, Intrauterine growth restriction, Premature rupture of membranes were studied.

Number of patients who delivered spontaneously vaginally, those requiring instrumentation and also those who required caesarean section was recorded. Fetal outcome, gestational age at birth, weight at birth, APGAR scores and requirement for NICU admission were analyzed. The statistical data was then analysed using SPSS 20. Variables studied were reported as the mean, range and standard deviation (SD). P values of <0.05 were considered to indicate statistically significant. The study was ethically conducted in accordance with Declaration of Helsinki.

RESULTS

Out of the total 1768 antenatal patients delivered during the year 2017 in our hospital, 51 patients presented with multiple pregnancy.

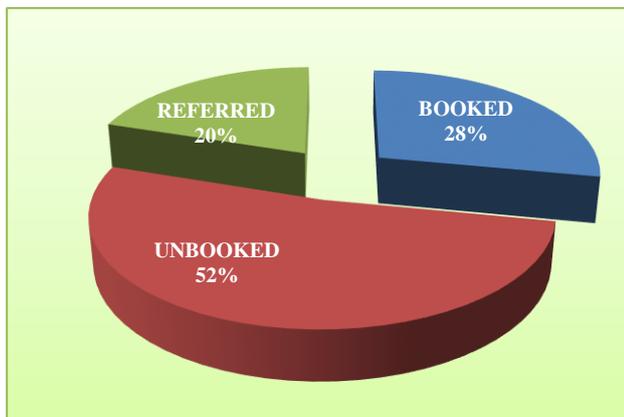


Figure 1: Incidence of multiple pregnancy according to booking status.

Of these, one had triplet pregnancy and was excluded from our study and rest 50 were cases of twin pregnancy. The incidence of twin pregnancy in our study was 2.8%. Fifty-two percent patients were un-booked, 20% referred from peripheral centres and rest were booked (Figure 1).

Table 1: Demographic and obstetric profile of the patients (n=50).

Parameter	Number	Percentage
Age		
<20 yrs	7	14
≤20 -29 yrs	28	56
≥30 yrs	15	30
Parity		
primipara	9	18
multipara	41	82
Gestational age (at delivery)		
≥26-<30 wks	3	6
≥30-<34 wks	23	46
≥34-<38 wks	19	38
≥38 wks	5	10

Mean maternal age of the patients in our study was 27.3 years (SD: 5.136; Range 18-38). Fifty-six percent patients were aged between 20 -29 years. Parity distribution of the patients showed 82% multipara and 18% primipara. The mean gestational age at delivery was 34.2 weeks (SD: 2.6; Range 28-40) (Table 1).

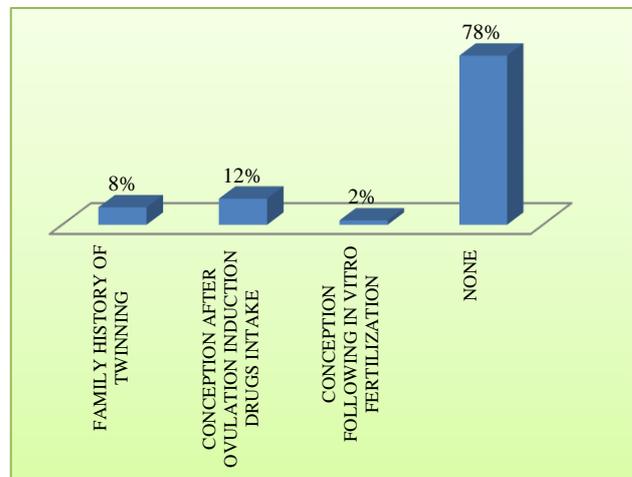


Figure 2: Probable causative factors for twinning.

Underlying probable causative factor for twinning was revealed to be conception after intake of ovulation induction drugs in 12% women. history of twinning was present in 8% women. One woman had conceived following IVF (Figure 2).

With respect to chorionicity, 60% of women were dichorionic. Fourteen percent were monochorionic – diamniotic and 6% patients were monochorionic-monoamniotic. Chorionicity was unknown in 20% cases (Figure 3).

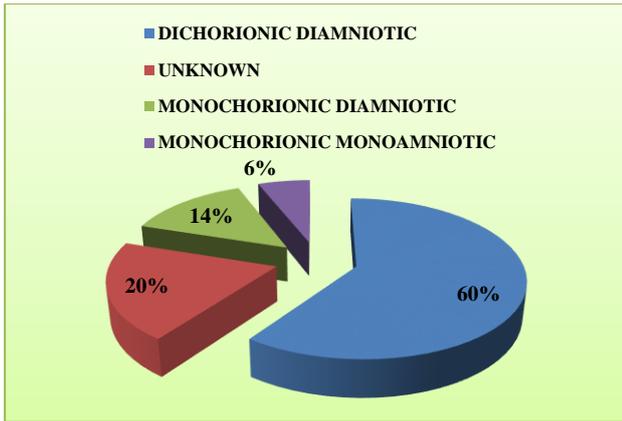


Figure 3: Distribution of patients by type of chorionicity.

Vertex - vertex (Vx-Vx) fetal presentation was most common presentation at delivery (52% patients) followed by Breech –vertex (B-Vx) in 18% women (Figure 4).

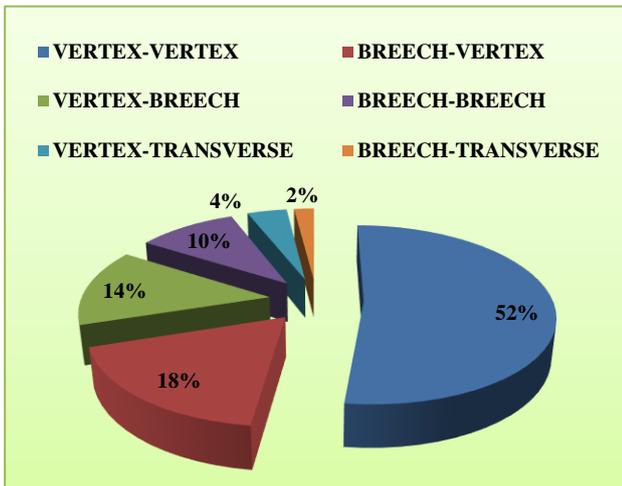


Figure 4: Distribution of patients by fetal presentation.

The most frequent mode of delivery was cesarean section (54%). Malpresentation and history of previous cesarean section were the main indications for cesarean delivery in our study (48% and 22.2% respectively). Spontaneous delivery was observed only in 36 % patients. Delivery interval between 1st and 2nd twin was <15 min in 78% cases (Table 2).

Preterm labour was the most common maternal complication of twin pregnancy (74% patients), followed by anaemia, encountered in, 62% cases. Thirty percent cases were complicated by pregnancy induced hypertension. One patient had post partum eclampsia and accounted for near miss mortality case in our study. Twenty-four percent patients had premature rupture of membranes. Antepartum haemorrhage and post partum haemorrhage complicated 16% and 18% cases respectively.

Table 2: Distribution of patients by mode of delivery, delivery interval b/w 1st and 2nd twin and indication of cesarean section in twin pregnancy (N=50).

Parameter studied	Number	Percentage
Mode of delivery		
Spontaneous	18	36
Assisted Breech	4	8
Instrumental	1	2
LSCS	27	54
Delivery interval b/w 1st and 2nd twin		
<15 min	39	78
15-30 min	10	20
31-60 min	1	2
Indication of LSCS in twin pregnancy (N=27)		
Mal presentation	13	48.14
Previous LSCS	6	22.22
Fetal distress	3	11.11
PIH	1	3.70
Non progress of labor	2	7.40
APH	2	7.40

There was no maternal mortality in the study. One of the patient with monochorionic twin pregnancy presented with Twin –Twin Transfusion Syndrome and one patient with dichorionic twin pregnancy had single Intrauterine Fetal Demise (sIUFD) at 1st trimester and delivered in 3rd trimester, one healthy fetus and other dead fetus weighing 304 gm (Table 3 and 4).

Table 3: Antenatal complications encountered among patients (n=50).

Complication	Number	Percentage
Anaemia	31	62
Hyperemesis Gravidarum	4	8
Hypertension (PIH/Pre eclampsia/eclampsia)	15	30
Polyhydramnios	3	6
APH (abruption, placenta previa)	8	16
PROM	12	24
UTI	3	6
Gestational diabetes	2	4
No associated complications	7	14
Complications inherent to twinning		
TTTS	1	2
TRAP	-	-
sIUFD	1	2

(Note:- Some patients had more than one complication, as such total will not correspond to 100%)

The common complications seen in the perinatal period were birth hypoxia /respiratory distress syndrome (58%), intrauterine growth restriction (15%), hyperbilirubinemia (11%) and neonatal sepsis (10%) (Table 5).

Table 4: Intrapartum maternal complications encountered among patients (n=50).

Complication	Number	Percentage
Preterm Labour	37	74
PPH	9	18
Sepsis	1	2
Preterm LSCS	10	20
Tears	14	28
Post partum eclampsia	1	2
No complication	0	0

(Note:- Some patients had more than one complication, as such total will not correspond to 100 %)

Table 5: Causes of perinatal morbidity (n=100).

Morbid condition	Number	Percentage
Prematurity	70	70
Birth weight		
<1kg	10	10
1-1.5 kg	40	40
1.6-2.5kg	38	38
>2.5 kg	12	12
IUGR	15	15
Birth asphyxia /hypoxia/RDS	58	58
Septicemia	10	10
Jaundice	11	11
Anaemia	15	15
Congenital malformations	6	6

Table 7: Comparison of incidence of birth hypoxia/asphyxia amongst first of the coming twins (Twin 1) and second of the coming twins (Twin 2).

Birth hypoxia	Twin 1 (T1) N	Twin (T1) %	Twin 2 (T2) N	Twin 2 (T2) %	Total	
					N (T1+T2)	Percentage
Present	20	34.5	38	65.5	58	58
Absent	30	71.4	12	28.6	42	42
Total	50		50		100	100

This difference in incidence of birth asphyxia was highly significant with Chi square value of 13.3 and P value of 0.0002

Table 8: Comparison of Apgar scores between the first and second coming twins.

APGAR scores	Twin 1 (T1)		Twin 2 (T2)		Total	
	N	%	N	%	N (T1+T2)	%
<7 at 1 min	14	41.2	20	58.8	34	34
>7 at 1 min	36	54.5	30	45.5	66	66
	50		50		100	100

Chi square value = 1.6; P value = 0.205 (not significant)

Also, the incidence of birth hypoxia /respiratory distress syndrome was found to be significantly higher among second coming twins (65.5%) than first coming twins (34.5%) (chi square value of 13.3 and P value of 0.0002) (Table 7). APGAR score of <7 at 1 min was seen in 34 % newborns. Apgar score <7 at 1 min was reported in 41.2% of first coming twins and 58.8 % of second

The incidence of these perinatal complications was found to be more among the second coming twins than their first coming counterparts. Low birth weight (LBW) in our study was defined as birth weight of <2.5 kg and 88% of the newborns were LBW.

Table 6: Comparison of birth weights of first of the coming twin (TWIN 1) and second of the coming twin (TWIN 2).

Parameter	Twin 1	Twin 2
Mean birth weight (gm)	1898gm	1560gm
Standard deviation (SD)	0.5505	0.5686

Using unpaired T test to find out whether there is significant difference in the weights between first and second twin we found the results statistically highly significant with P value <0.003.

The second coming twins were found to have lower birth weights than the first coming twins. The mean birth weight of first coming twins (TWIN 1) was 1898 gm; SD: 0.5505 and that of second coming twins (TWIN 2) was 1560 gm SD:0.5686. Using unpaired T test to find out whether there is significant difference in the weights between first and second twin we found the results statistically highly significant with P value <0.003 (Table 6).

coming twins. However, this difference in APGAR scores was not statistically significant (Chi square value = 1.6; P value = 0.2) (Table 8). NICU admission was required in 66 % of all neonates, (TWIN 1: 45.45%; TWIN 2: 54.55%). However, this difference amongst first and second coming twins was not statistically significant (Chi square value <0.84) (Table 9).

Table 9: Comparison of requirement of NICU among first of the coming twins (TWIN 1) and second of the coming twins (TWIN 2).

NICU requirement	Twin 1 N	Twin 1%	Twin 2 N	Twin 2 %	Total	
					N (T1 + T2)	%
Required	30	45.45	36	54.55%	66	66
Not required	20	58.82	14	41.18%	34	34
Total	50		50			

However, this difference amongst twins was not statistically significant (Chi square value <0.84)

Table 10: Perinatal mortality among twin 1 and twin 2 (N=100 babies) in relation to mode of delivery.

Mode of delivery	Total No of patients	Total No of births	Perinatal deaths (TWIN 1)	Perinatal deaths (TWIN 2)	Total perinatal deaths (T1+T2)	Perinatal mortality %
Spontaneous vaginal delivery	18	36	3	6	9	52.9
Assisted breech delivery	4	8	0	1	1	5.9
Instrumental delivery	1	2	0	1	1	5.9
LSCS	27	54	1	5	6	35.3
Total	50	100	4	13	17	100

Perinatal mortality in present study was 17%; Chi square value= 0.269; P value= 0.622

Total 50 women gave birth to 95 live births, 4 babies were fresh still born, 1 baby was macerated abortus weighing 304 gm. Out of these 12 babies could not survive more than one week owing to complications. Perinatal mortality in our study was 17% or 170/1000. Highest mortality was associated with instrumental delivery (50%) (Table 10). Neonatal outcome is summarized in Table 11. Neonatal morbidity increases as gestational age at delivery decreases.

Table 11: Neonatal outcome (n=100).

Parameter	Number	Percentage
Live births	95	95
NICU admission	66	66
Neonatal death at 1 st wk	12	12
Still birth		
Fresh still born	4	4
Macerated still born	1	1

DISCUSSION

Twin pregnancies are high risk pregnancies requiring special care and multidisciplinary approach towards their management. The incidence of twin pregnancy in our study was 2.8% which is quite high in contrast to traditional incidence of 0.2-2%.⁵ This higher incidence found in our study can be attributed to growing trend towards child bearing at advanced maternal age and disseminated use of Assisted Reproductive Techniques (ART) as 12% patients in present study had conceived after treatment for infertility with clomiphene citrate and

one patient had conceived with IVF. Hence 14 % patients in our study can be labelled as cases of iatrogenic twinning. The same finding was reported in study by Sultana et al where rate of iatrogenic twinning was also 14%.¹⁰ Majority of the women in present study (56%) were aged between 20 -29 years. This is consistent to a study by Spellacy et al where 55% were aged between 20 -29 years.¹¹ Parity distribution of our study showed 82 % patients as multipara which is consistent to report by Spellacy et al where 84.2% patients were multipara. Mean gestational age of women at delivery in our study was 34 .2 weeks.¹¹ As compared to other studies, the average weeks of gestation are comparable with our study i.e 34 weeks, as the average weeks of gestation among twins being 33 weeks by Erdemoglu et al and 34 weeks by Yuel et al.^{12,13} Placentation was determined by antenatal ultrasonography and inspection of placenta and membranes after birth. Dichorionic placentation was seen in majority (60%) in our study, which is comparable with Erdemoglu et al (69.3%) and Panwala et al (63.8%).^{12,14} Vertex –vertex (vx-vx) presentation at delivery was most common fetal presentation in present study (52%) and was to be consistent with another study by Chowdhury et al (47.5%) and Panwala et al (51.4%).^{14,15} Most frequent mode of delivery in our study was by lower segment cesarean section (54%), consistent to studies by Chowdhury and Sultana (49.1% and 56% respectively).^{10,15} Malpresentation was the most common indication for cesarean section in our study (48.14%) which is comparable with Erdemoglu et al (46.3%).¹² Forty-six percent patients delivered vaginally. Out of these four patients had assisted breech delivery and in one patient forceps delivery was required to deliver the

after coming head of second breech twin. The delivery interval between first and second twin was <15 min in 78% patients and <30 min in 20 % patients. In one patient second twin was delivered 56 minutes after the first twin.

Authors found higher neonatal morbidity in second coming twins especially in cases where the delivery interval between the two twins was >15 min. From this we conclude that there should be minimum delay in the delivery of second coming twin to prevent post natal complications. Preterm labour was found to be the most common maternal complication in our study seen in 74% cases. Preterm delivery rate in our study was 70% and we found a high pre term cesarean section rate of 20% in present study. This finding is in contrast to previous studies by Papicnik, Chowdhury and Sultana where preterm delivery rates were 50.7%, 41.5% and 44% respectively.^{10,15,16} Higher preterm delivery rate in present study could be attributed to higher incidence of associated obstetric and /or medical co-morbidities in our patients, necessitating early delivery. Anaemia was the second most common maternal complication in our study reported in 62% patients in present study whereas the corresponding figures reported by Chowdhury and Brown et al were 35.8% and 35.5% for anaemia.^{15,17} Hence authors reported higher incidence of anemia in our study. However, a much higher incidence of anemia was found by Bangal et al (84%).¹⁸ This discrepancy in incidence of anaemia may be due to difference in prevalence of anaemia in different regions. Birth hypoxia was reported in 58% of neonates. The incidence of birth asphyxia was much higher among second coming twins (65.5%) than first coming twins (34.5%). Hypertensive disorders (PIH/ Pre-eclampsia / Eclampsia) were reported in 30% patients in present study. This is higher in comparison to that observed in studies by Bangal et al and by Chowdhury et al where they were observed in 18% and 22.6% cases respectively.^{15,18} Post partum haemorrhage occurred in 18% cases in present study which bears consistency to study by Chowdhury (18.9%).¹⁵ Twenty –four percent of the patients were admitted with Premature Rupture of Membranes (PROM). However, Chowdhury and Sultana reported lower rate of PROM for twin pregnancy (3.8% and 10% respectively).^{15,10} Twin Twin Transfusion syndrome was seen in one patient where one baby had polyhydramnios and second baby had Intrauterine growth restriction with oligohydramnios. Both babies of this patient however survived. There was no maternal mortality in present study. Twin pregnancy is known to be associated with significant perinatal morbidity and mortality.

Authors observed perinatal mortality of 17 % in our study which is higher than that found in studies by Chowdhury and Sultana et al.^{10,15} Authors observed higher perinatal mortality among unbooked patients and patients referred from periphery (21.42%) in comparison to booked patients (15.2%) which reflects importance of proper antenatal care for better fetomaternal prognosis in twin pregnancies. The incidence of stillbirth in our study was

5%. Sixty - six percent of the neonates required NICU admission owing to neonatal morbidity. Low birth weight and prematurity were the leading causes for perinatal morbidity in our study (88% and 70% respectively) followed by birth hypoxia in 58% babies. The incidence of congenital malformations in present study was 6%. One case each of lumbar meningocele, hydrocephalus and omphalocele and 2 cases of ventricular septal defects was seen. In one case, 2nd delivering twin, had talipes equinovarus deformity owing to oligohydramnios. It is a well known fact that the second of the coming twins is usually more compromised than the first of the coming twins. The same was observed in present study also. Neonatal parameters like birth weights, APGAR scores, incidence of birth asphyxia and NICU requirement were compared amongst first coming and second coming twins and the results were analysed statistically by Unpaired T test and Chi square test. Birth weight discrepancy of 20% or more than it was considered as significant discordant growth in our study. The incidence of discordant growth in our study was 30% (15 pairs). APGAR score of <7 at 1 min was observed in 34% all babies. Of this, the incidence of 1min APGAR <7 among Twin 1 babies was 41.2 % and among twin 2 babies was 58.8%, showing that low APGAR score was more common amongst the second of the twins as compared to first of the twins in present study. However, this difference in APGAR scores between the two groups was not significant statistically with Chi square value of 1.6 and P value of 0.205. This may be attributed to the fact that our study included small sample size of 50 patients and also to the high cesarean section rate in present study which decreased the delivery time interval between the first and the second twins, leading to lesser difference in 1 min APGAR scores among the twins. The incidence of birth asphyxia in our study was 58%. The incidence of asphyxia amongst second of the coming twins was more (N=38; 65.5%) in comparison to first of the coming twins (N= 20; 34.5%) and was highly significant with Chi square value of 13.3 and P value of 0.0002. NICU requirement was in 66% of the babies owing to neonatal morbidities. Of these 30 of the first coming twins (45.45%) and 36 of the second twins (54.55%) required NICU admission.

Low birth weight and prematurity are known leading causes of perinatal morbidity and mortality. The incidence of birth hypoxia, perinatal deaths and NICU requirement increases as gestational age at delivery decreases. The same was noted in present study.

CONCLUSION

Multiple pregnancies are associated with higher maternal and fetal/neonatal adverse outcomes. Early detection of high risk cases, timely referral, frequent antenatal visits and early hospitalization with good neonatal care set up are necessary to improve maternal and neonatal outcomes.

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