

ORIGINAL RESEARCH

A study of outcome of neonates in twin pregnancies

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Abstract

Twin pregnancy refers to a pregnancy where the mother carries two fetuses in utero at the same time. Twins can either be monozygotic or dizygotic. The rate of multiple pregnancies has increased over the last few decades which is attributed to rising average maternal age, a decline in fertility and an increase in the use of assisted reproductive techniques. Both maternal and fetal complications are significantly raised in multiple gestational pregnancy. This study has been undertaken to analyze neonatal outcome in twin gestational pregnancy and to have better knowledge of maternal and perinatal complications. This was a retrospective observational study conducted at a tertiary care hospital in the city of Ahmedabad over a period of one year (1st January 2022 to 31st December 2022). All twins admitted in the PNC ward, in the NICU and IUD babies were included in the study. Data was collected with detailed proformas from case histories of both the mother and the babies' case papers and was analyzed according to appropriate statistical methods. A total of 62 sets of twins (124 babies) were studied through the study duration. Most of these twins were delivered by LSCS at term gestation. However, majority of the babies born were Low Birth Weight babies. A mean weight of about 1.7 kg was seen in our study group. It was observed that 57.25% of the neonates were admitted into NICU for further management of complications. Although the complications associated with twin pregnancies cannot be prevented but can be better managed, through timely diagnosis and intervention for the same and equal involvement of both the obstetrician and pediatrician in management of these cases. Some of the complications of the admitted neonates – such as birth asphyxia, prematurity, and TTNB – are difficult to prevent; a few other complications such as RDS, neonatal jaundice, and sepsis can be prevented by ensuring appropriate antenatal interventions and proper counselling and guidance of mothers for care for twin babies. A multiple gestation pregnancy poses a challenge for both the obstetrician and the pediatrician.

Key words: twin pregnancies, neonates

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Introduction

The rate of multiple gestational pregnancy has increased over the past few decades particularly in high income or middle-income countries due to advanced maternal age, a decline in fertility resulting in an increased use of assisted reproductive techniques¹ and drugs for ovulation induction. Some of the other factors that influence the occurrence of

multiple gestation pregnancies include race, family history (hereditary), maternal age and parity.

Twins can be either monozygotic or dizygotic. Monozygotic (MZ) twins originate and develop from a single fertilized egg (zygote) as a result of division of the inner cell mass of the blastocyst. While, dizygotic (DZ) twins are formed due to fertilization of two separate ova by two different sperm. MZ twins

commonly have one placenta with one chorion and two amnions or rarely, a single amnion. If early splitting occurs – before the formation of chorion and amnion (between day 0 and day 3) – MZ twins may have two placentae with two chorion and two amnions (dichorionic diamniotic). DZ twins always have a dichorionic and diamniotic placenta. A carefully performed visual examination of the placenta and membranes following delivery serves to establish zygosity and chorionicity.¹

Clinical examination with accurate measurement of fundal height is essential. With multiple fetuses, uterine size is typically larger during the second trimester than in a singleton pregnancy.

Late in the first trimester, fetal heart action may be detected with Doppler ultrasonic equipment. Multiple gestational sacs can be detected by ultrasonography as early as 5 weeks and cardiac activity can be detected from more than one fetus at 6 weeks. CRL discrepancy in twin pregnancies in the first trimester is a frequent finding. Discrepancy >95th centile indicates major growth delay of one twin, which could indicate even the presence of aneuploidy. For milder degrees of discordance, the CRL of the smaller fetus is a more accurate estimate of the actual gestational age.

The degree of maternal physiological change is greater with two fetuses than with a single fetus. Maternal adaptation to twin pregnancy leads to various complications and thus constituting a significant proportion of high-risk pregnancies. Antenatal complications like ante partum hemorrhage, anemia, PIH, eclampsia, gestational diabetes, preterm labour, PROM, and polyhydramnios are more common in multiple gestation. Due to the higher risk involved in twin pregnancies, obstetricians need to be more vigilant ante partum, intra partum & post-partum care.

Several common and uncommon complications exist of multiple gestation pregnancies, resulting in higher morbidity and mortality amongst these neonates. Some of the common complications seen amongst these neonates are prematurity, low birth weight – resulting in long-term morbidities such as bronchopulmonary dysplasia, necrotizing enterocolitis, retinopathy of prematurity, cerebral palsy, cognitive deficits, autism spectrum disorders; intrauterine growth restriction, fetal growth discordance, intrauterine fetal demise. A few

uncommon complications such as congenital malformations also encompassing vascular malformations resulting in syndromes such as TTTS and TRAP, are also more often seen in multiple gestational pregnancies.² These syndromes often hold a grave prognosis for the neonates if not intervened timely.

This study allows for analysis of neonatal outcomes in multiple gestational pregnancy, allowing better understanding of perinatal complications of twin pregnancies, guiding towards prevention and timely management of these complications; and subsequently improve outcomes of the same.

Materials and Methods

The study was conducted at Smt. Shardaben General Hospital, a tertiary care teaching hospital in Ahmedabad. Approval was obtained from the local authorities for conducting the study. It was a retrospective observational study involving hospital records taken over a period of one year (January 2022 - December 2022).

Inclusion criteria: All twin babies delivered during the study duration were enrolled in the study. IUD twins were also enrolled in the study.

Exclusion criteria: Twins with either one or both of the babies still born were excluded from the study.

Sample size: The final sample size was based on the duration of the study. 62 sets of twins were delivered during the duration of the study and their details were obtained from the hospital records. Some relevant maternal details such as mode of delivery, presentation of the fetus, and maturity of the fetus were obtained from maternal case records. Other neonatal details including morbidity and mortality were obtained from the neonate's case record sheets and noted.

All the details were noted, tabulated and analyzed as per the appropriate statistical method.

Results

In our study we had enrolled 62 sets of twins as per the inclusion criteria.

In this study we have analysed the neonatal outcomes for twin gestational pregnancies and some of the maternal complications observed in these mothers.

Table 1: Antenatal Complications

Complication	Number	Percentage
Anemia	32	50%
Hyperemesis gravidarum	4	6.25%
Hypertension (PIH/ pre-eclampsia)	24	37.5%
Polyhydramnios	4	6.25%
APH (abruption, placenta previa)	2	3.125%
PROM	22	34.3%
UTI	10	15.62%
Gestational diabetes	4	6.25%

No associated complications	10	15.62%
Complications inherent to twinning		
TTTS	1	1.61%
SIUFD (Single Intrauterine Fetal Demise)	3	4.675%
IUD of both twins	2	3.225%

(Note: Total percentage will not be equal to 100% as some patients had more than one complication).

Most common maternal complication found in twin pregnancy was preterm labour seen in 67% patients. Other complications were anaemia (50%), PIH (40%), premature rupture of membranes (33%) and post-partum haemorrhage (16.6%).

Table 2: Mode of Delivery

Mode of delivery	Number	Percentage
Normal delivery	24	38.70%
Caesarean section	38	61.29%
Total	62	100%

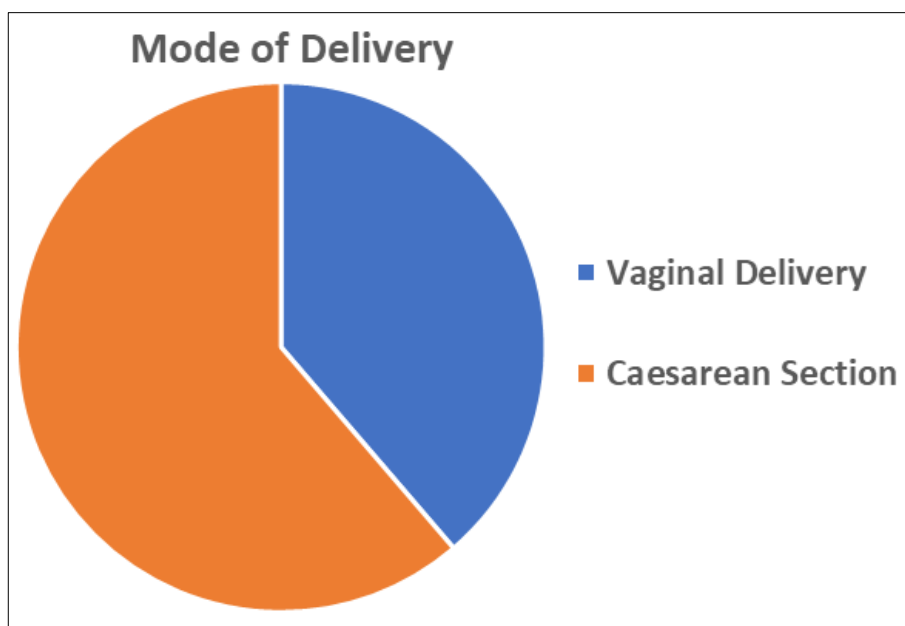


Fig 1: Mode of Delivery

In our study we noted that majority of the twin gestational pregnancies were delivered via Caesarean section - about 38 out of the 62 deliveries were delivered by LSCS while only 24 of them were delivered by vaginal delivery.

Presentation of foetus

Through our study it was noted that most twins had variable presentation – only 45% of them showed vertex – vertex presentation. Thus, making LSCS the more common mode of delivery in twin gestational pregnancy.

Table 3: Intrapartum complications

Complication	Number	Percentage
Preterm labour	37	59.67%
PPH	10	15.6%
Sepsis	2	3.125%
Preterm LSCS	16	25%
Post-Partum Eclampsia	2	3.125%
No Complications	16	25%

Several intrapartum complications were also noted through our study. Most common intrapartum complication noted was preterm labour (59.67%)

alongside other complications such as PPH, Sepsis, Preterm LSCS, and post-partum eclampsia.

Table 4: Fetal maturity at the time of birth

Maturity	Number	Percentage
Term	50	40.32%
Extreme Preterm	3	2.41%
Preterm	71	57.25%
Post-term	0	0
Total	124	100%

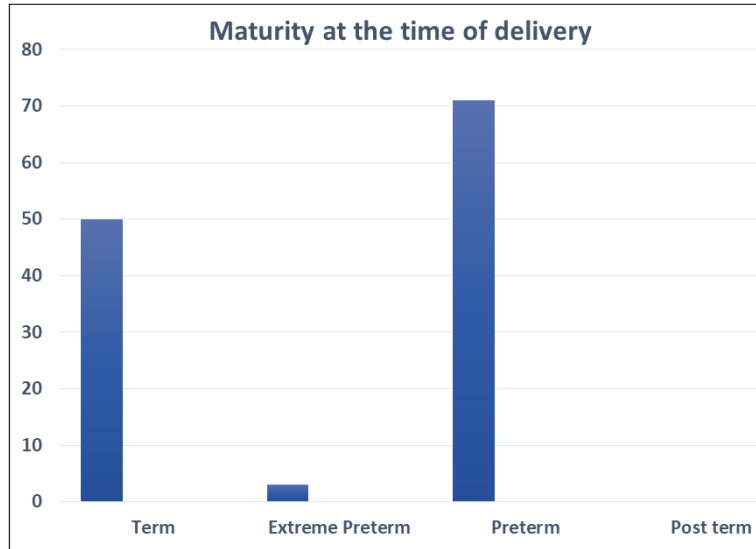


Fig 2: Maturity at the time of delivery

- Prematurity is one of the most common neonatal complications observed in multiple gestation pregnancies. The average duration of gestation is shorter in multifetal pregnancies and further shortens as the number of fetuses increases.
- In this study too, we observed that most neonates born were preterm (71 preterm births and 3 extreme preterms) as opposed to 50 term births.

Table 5: Birth weight of twins

Birth weight	Twin 1	Twin 2	Total
>2500 grams	9	5	14
1500 – 2500 grams (LBW)	48	47	95
1000 – 1499 grams (VLBW)	9	5	14
<1000 grams (Extremely LBW)	0	1	1
Total	66	58	124
Mean	1.740grams	1.710grams	
SD	0.394	0.351	

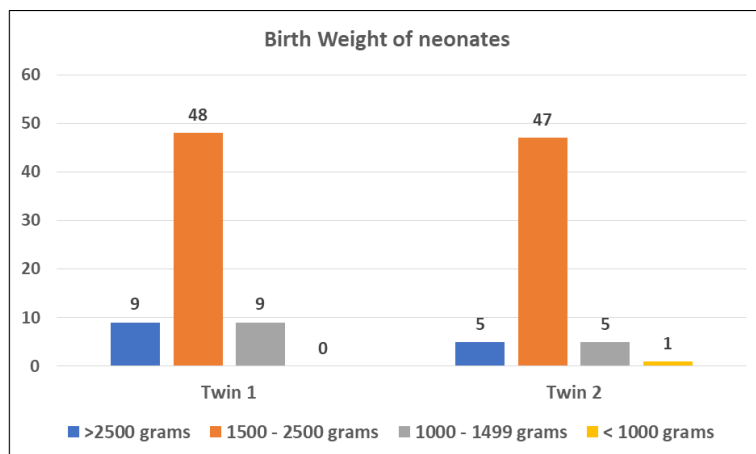


Fig 3: Birth Weight of neonates

- It is known that in multiple gestation pregnancies growth of the fetuses is not affected up to 30 weeks of gestation, i.e., the growth of fetuses in multiple gestation pregnancies is at par with the fetus of a singleton pregnancy upto 30 weeks of gestation. However, after 30 weeks of gestation, the growth gradually falls off as compared to a singleton pregnancy.
- Another common complication of neonates born through a multiple gestation pregnancy is low birth weight. This combined with prematurity at birth often results in several co-morbidities such as bronchopulmonary dysplasia, necrotizing

enterocolitis, retinopathy of prematurity and intraventricular hemorrhage (IVH).

- In this study too, we have observed that most neonates belonged to the low birth weight category (95 babies) and the study group had a mean weight of 1.740 grams in twin 1 and 1.710 grams in twin 2.

Neonatal outcome at the time of birth

It was observed that out of the 124 neonates born during the study period from twin gestation pregnancies, a total of 71 neonates were admitted in the NICU.

Table 6:

Outcome		Number	Percentage
Admitted in NICU		74	57.25%
Post-Natal Care		45	38.70%
IUD	One twin	3	2.41%
	Both twins	2	1.61%
Total		124	100%

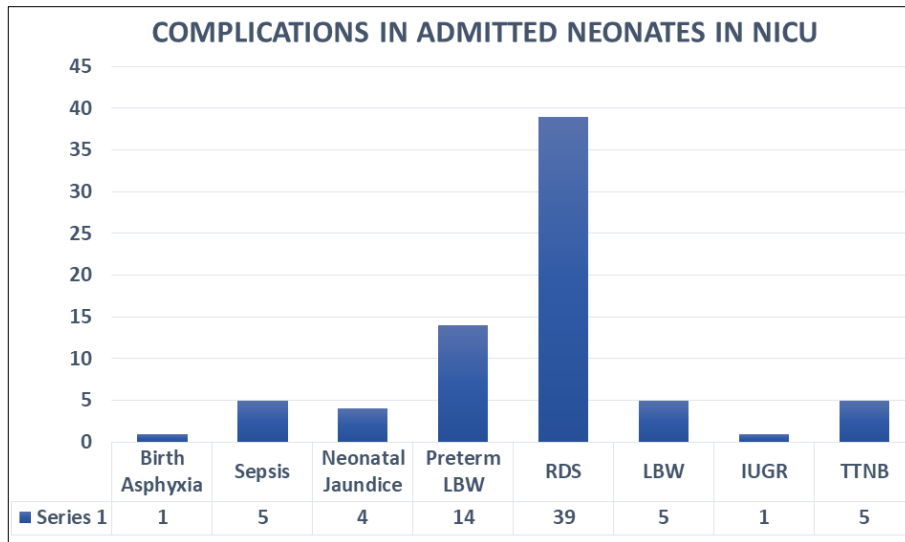


Fig 4: Complications in admitted neonates in Nicu

Complications of the admitted neonates

The most common complication observed in our study responsible for the admission of neonates to the NICU was Respiratory Distress Syndrome (RDS) owing to

the higher number of preterm and extreme preterm neonates born. It was also observed that RDS was often accompanied with LBW of the neonates.

Table 7: Outcome of admitted neonates

Outcome	Number	Percentage
Discharged	65	87.83%
DAMA	0	0
Expired	9	12.16%
Transfer	0	0
Total	74	100%

We have observed that out of 74 neonates admitted in NICU, 65 of them were discharged while 9 neonates expired during the course of hospitalization in NICU

Cause of mortality amongst expired neonates: The most common cause of mortality amongst the admitted neonates was observed to be respiratory distress syndrome, followed by neonatal sepsis and birth asphyxia respectively.

Limitations of the study

A major limitation of the study was the limited sample size. As a result of which, some of the rarer complications and outcomes of twin gestational pregnancies could not be studied.

Being a retrospective study, several of the maternal factors that influence the incidence of twin gestational pregnancies and also complicate such pregnancies could not be ascertained.

A better study design with more extensive sampling and longer study duration would have helped study the neonatal outcomes and complications better.

Conclusion

This study conducted at the Paediatrics Department of a tertiary care hospital for a period of 1 year was a retrospective observational study from January 2022 – December 2022 with a sample size of 62 sets of neonates. Data was collected with the help of a detailed proforma from hospital records. The proforma had several known and suspected risk factors contributing towards NICU hospitalization, comorbidities and mortality amongst neonates of twin pregnancies.

About 60% of all the neonates born were preterm at birth. It is a known fact that the mean gestational age decreases as the number of fetuses increase. The mean gestational age is found to be 36 weeks for a twin pregnancy. This is often attributed to maternal complications that are seen during the pregnancy – such as anemia, PIH, gestational diabetes, and platelet dysfunction. A similar observation was seen in a study by Dharani *et al.*¹ who also observed 73% preterm births, 18% extreme preterm births and 9% term gestational deliveries.

Our study also showed that the most frequent complication seen amongst the admitted neonates was RDS (52.70%) followed by prematurity and low birth weight (18.75%). While all other complications such as birth asphyxia, sepsis, neonatal jaundice and TTNB were at < 10%. However, a similar study carried out by Sijian Li *et al.*³ had preterm LBW (55.3%), RDS (1.1%), birth asphyxia (4.3%), pneumonia (5%) and sepsis (3.3%) as complications of the admitted neonates.

PPH complicated 15.6% cases in present study which was similar to the study by Chowdhury (18.9%)⁴. Several other antenatal and intrapartum complications of the mother have also been identified which are higher when twins are delivered at earlier gestational age. High-risk cases should be identified early and managed. Regular antenatal visits, adequate rest, administration of steroids, and good nutrition are important to improve the outcome. Early hospitalization, careful intrapartum monitoring and better NICU facilities are essential to reduce the risk to mother and baby.

The strength of the study lay in the retrospective study design based on hospital records, which allowed for

thorough analysis of all the suspected neonatal complications of twin gestation pregnancy.

Through this study, we have come to realise that a multiple gestation pregnancy poses as a challenge for the doctors – requiring pooled efforts of both the obstetrician and the paediatrician. Although complications of a multiple gestation pregnancy cannot be prevented, but their early screening, diagnosis and timely management help prevent serious neonatal complications and subsequently reduce NICU admissions and duration of hospitalization.

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