Section: Obstetrics and Gynaecology

Original Research Article

COMPARISON OF PERINATAL OUTCOME OF THE SECOND TWIN WITH RESPECT TO TWIN 1 AT A TERTIARY CARE HOSPITAL

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Abstract

Background: Integral complications of multiple pregnancies are at high risk of perinatal mortality and morbidity along with maternal complication and socio-economic problems. The objective is to compare the perinatal outcome of the second twin with respect to twin 1. **Materials and Methods:** This cross-sectional study, involved 75 women with twin pregnancy diagnosed clinically and confirmed by ultrasound with a gestation >28weeks willing to give informed consent. The demographic data, obstetric history, intra-partum management, neonatal characteristics, perinatal morbidity and mortality data was noted in the proforma. **Result:** Mean age of the study population was 25.04years and mean gestation age was 35.55±2.303 weeks. Majority of the women were either late pre-term or pre-term. Majority of the pregnancy was booked case, primigravida, nulliparous and had history of abortion. 72% had DCDA and 28% had MCDA. Mean inter-delivery interval was 15.1±10.733 minutes. APGAR score at 1 minute and 5minutes were significantly less in twin 2 compared to twin 1. Commonest presentation was vertex presentation. Commonest mode of delivery was vaginal delivery in both twin 1 and 2 (78.7% and 70.7%), followed by LSCS (13.3% and 16% respectively). Twin 2(62.66%) had higher NICU admission rate compared to twin 1(44%). Common reasons for NICU admission were respiratory distress, low birth weight and neonatal jaundice. Perinatal mortality was 4% in twin 1 and 8% in twin 2. Perinatal morbidity of twin 2 was evaluated in comparison with NICU admission. Pre-term delivery, Chorionicity of DCDA, mode of delivery, APGAR score at 1 minute had significant association with NICU admission of twin 2. **Conclusion:** Perinatal morbidity in twin 2 is associated with Pre-term delivery, Chorionicity of DCDA, mode of delivery, APGAR score at 1 minute. Perinatal morbidity in twin 2 is higher than twin 1, along with its association with pre-term delivery.

INTRODUCTION

Multifetal pregnancy or twin gestations are seen at an increasing trend in the world. Twin pregnancies comprises of ~3.3% of all pregnancies.[1] Incidence of Twin pregnancy varies worldwide. The increasing incidence of twin pregnancy is particularly ascribed to increasing iatrogenic interventions like assisted reproductive techniques (ART).[2,3] Multiple pregnancy is a high-risk situation because of its inherent risks to mother and the foetus. Inherent complications of multiple pregnancies are high risk of perinatal mortality and morbidity coupled with maternal complication.[3] There are ethnic and racial variations in the prevalence of twin pregnancy with twinning as low as 2/1000 in China and Japan; Europe and USA have an intermediate incidence of 5.9-8.9/1000 pregnancies with the highest incidence in Nigeria with 49/1000 pregnancies.[4]

Among the singleton pregnancies and twin pregnancies, twin pregnancies pose an elevated risk both to the mother and the babies. The complications are attributed to an exaggerated physiological response, hyperplacentosis, over distension of uterus, preterm labor, malpresentation, increased operative intervention, postpartum hemorrhage, etc. Twin pregnancies are also associated with prematurity, increased fetal loss, intra uterine death, low birth weight, birth trauma, birth asphyxia, etc contributing to the high perinatal mortality. Perinatal mortality and morbidity are said

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to be four to five times higher in twin pregnancy and six times higher in triplets compared to a singleton pregnancy.[5]

Studies have shown that even among twins, the second twin is particularly vulnerable to adverse perinatal outcomes. The second twin is more likely to have low apgar scores, less favourable umbilical arterial and venous parameters, respiratory distress syndrome, higher need for intubation and hence increased perinatal mortality and morbidity.[6,7] The second twin is at a higher risk due to the separation of the placenta, cord compression, cord prolapse, discordant growth, malpresentation, birth trauma, and increased instrumental delivery, time interval between deliveries, increasing their susceptibility to perinatal hypoxia, sepsis and respiratory distress.[8,9]

The aim of this study is to evaluate the perinatal outcome of the second twin in a twin gestation at a tertiary care centre with a study period of 18 months extending between February 2021 and August 2022.

MATERIALSANDMETHODS

This Hospital based cross sectional, descriptive study was conducted in IPD of Obstetrics and Gynecology Department in Vani Vilas Hospital, BMCRI. Duration of study was February 2021 to August 2022.

Sample size Calculation

The sample size is calculated based on the prevalence of twin gestation comprising of 3.3% of all pregnancies.[1]

n= Za2 x pq /d2

Where n=sample size

Za=Z value (e.g. 1.96 at 95% confidence interval)

p=prevalence twin gestation= 3.3%

q=(100-p) =96.7%

d=absolute precision of 5%

Substituting the values above, gives a sample size of 49.03 which is rounded off to 50.

Inclusion Criteria

1. Patient willing to give informed consent.
2. Women with twin gestation diagnosed clinically and confirmed by ultrasound
3. Women with twin gestation more than 28 weeks of gestation
4. Absence of congenital anomaly in either fetus

Exclusion Criteria

1. Patient not willing to give informed consent.
2. Women with twin gestation less than 28 week of gestation
3. Women with multifetal gestation other than twin pregnancy
4. Intrauterine deaths of either of the fetus
5. Congenital anomaly in either fetus

Methodology: After obtaining approval and clearance from the institutional ethics committee, the patients fulfilling the inclusion criteria will be enrolled for the study after obtaining informed consent. The booked cases in the hospital will be followed up in the antenatal clinic. All the emergency admission cases fulfilling the inclusion criteria will also be studied after obtaining informed consent. For all the delivered babies of the study participants, the perinatal outcome will be noted. All relevant information from the case record will be noted including maternal age, gravidity, parity, clinical examination, ultrasound reports, gestational age at birth, presentation of the foetuses, mode of delivery, birth weight, apgar score, need for NICU admission will be noted. The babies will be followed up till discharge. The cause of death will be noted in case of perinatal death.

Outcome Measures: The perinatal outcome of the second twin will be evaluated with respect to apgar scores at 1 minute and 5 minutes, birth weight, need for NICU admission and perinatal mortality and morbidity and the cause for the same.

The obstetrical factors such as gravidity, gestational age, presentation, mode of delivery, any operative or instrumental intervention required for the delivery of the second twin, inter delivery interval between the first and second twin, chorionicity of the placenta will be noted.

Statistical Analysis: The collected data will be analyzed by appropriate statistical tests and SPSS software version 20.0. Descriptive statistics of the explanatory and outcome variables will be calculated by mean, standard deviation for quantitative variables, frequency and proportions for qualitative variables. Inferential statistics like Chi-square test will be applied for categorical variables. Outcome of the patients will be analyzed using appropriate parametric and non-parametric test for significant association between the variables. The level of significance is set at 5%. Any other necessary tests found appropriate will be dealt at the time of analysis based on data distribution.

RESULTS

Mean age of the study population was 25.04 ±4.413 years. Mean gestation age was 35.55±2.303 weeks. majority of the women had gestational age between 32 to 36weeks, followed by 29.33% between 37 to 42weeks and 16% between 28 to 32weeks. 70.67% of the women had pre-term delivery.

94.7% of the cases were booked cases and 5.3% were unbooked cases. 42.7 % cases had gravida 1, 40% cases had gravida 2 and 17.3% cases had gravida 3. 42.7% had parity 1 and 5.3% had parity 2. 42.7% had 1 living and 4% had 2 living. 78.7% of the women had history of abortions.

72% had DCDA and 28% had MCDA.

70.7% of the mothers did not have any co-morbidities. Mothers who had comorbidties had 8% moderate anemia, 6.7% geatational hypertension, 5.3% severe eclampsia, 2.7% antepartum eclampsia, 2.7% impending eclampsia, 1.3% non severe eclampsia, 1.3% severe anemia and 1.35seizure disorder.

34.7% patients presented in early labour, 20% in active labour, 14.7% in PPROM, 8% second stage

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of labour, 6.7% PROM induced, 2.7% not in labour, followed by not in labour- induced, PPROM 2nd stage, PPROM in AL, PROM, PROM induced, PROM in AL, PTL and induced.

82.7% of women undergoing LSCS has no indication. 2.7% non-progression of labour, 2.7% leading twin in non-vertex, followed by Non progression of Labour, Non-Vertex Presentation, Unfavourable Cervix, First Twin Transverse lie, Second Twin In transverse lie, Cord Prolapse, Face presentation, Foot Prolapse and Transverse lie.

Twin Characteristic Frequencies

Mean inter-delivery interval was 15.1±10.733 minutes.

Mean birth weight of twin 1 was 2.03kgs and twin 2 was 2.25kgs.

APGAR at 5minutes was 7.85 in twin 1 and 7.57 in twin 2. APGAR score at 1 minute was 6.75 in twin 1 and 6.16 in twin 2. This showed statistically significant difference between the groups.

Majority of the presentation observed was vertex presentation. 85.3% of the twin 1 and 77.3% in twin 2 had vertex presentation. Followed by 14.7% in twin 1 and 20% in twin2 had presented with breech. 2.7% of twin 2 had vertex presentation. Though not statistically significant.

Majority of the women delivered twins vaginally, 78.7%(n=59) in twin 1 and 70.7%(n=53) in twin 2. 13.3%(n=10) in twin1 and 16%(n-12) in twin 2 had LSCS. One twin 1 had vacuum delivery. About 6.7%(n=5) of the first twins and 12% (n=9) of the second twins had assisted breech delivery. For one of the second twins (1.3%) caesarean section was done for transverse lie after vaginal delivery of the first twin. Mode of delivery did not show statistical difference between the twins. 2 cases caesarean section was done for second twin who failed for internal podalic version.

44%(n=33) in twin 1 and 62.66% (n=47)in twin 2 had NICU admission. Among the NICU admissions in twin 1, 34.7% had respiratory distress and low birth weight, 6.7% had only respiratory distress, 1.3% had low birth weight and 1.3% neonatal jaundice. Among the NICU admissions in twin 2, 28% had respiratory distress, 33.33% had low birth weight and 1.3% had neonatal jaundice.

4% in twin 1 and 8% in twin 2 experienced mortality.

Table 1: APGAR score.

APGAR score	Twin 1	Twin 2	P value
At 1 minute	6.57±0.756	6.16±0.823	0.002
At 5minutes	7.85±0.692	7.57±0.738	0.018

Table 2: Twin presentation

Twin presentation	Twin 1		Twin 2		
	Frequency	Percent	Frequency	Percent	P value
Vertex	64	85.3	58	77.3	0.233
Breech	11	14.7	15	20.0	
Transverse	0	0	2	2.7	
Total	75	100.0	75	100.0	

Table 3: Mode of Delivery

Mode of Delivery	Twin 1		Twin 2		P value
	Frequency	Percent	Frequency	Percent	
VD	59	78.7	53	70.7	0.470
LSCS	10	13.3	12	16.0	
Assisted Breech	5	6.7	9	12.0	
Vacuum Delivery	1	1.3	0	0	
Transverse lie VD	0	0	1	1.3	
Total	75	100.0	75	100.0	

Table 4: NICU admission of twins

	Twin 1		Twin 2	
	Frequency	Percent		
NIL	42	56.0	28	37.3
Respiratory distress	5	6.7	21	28.0
Resp distress,LBW	26	34.7		
LBW	1	1.3	25	33.3
Neonatal Jaundice	1	1.3	1	1.3
Total	75	100	75	100.0

Table 5: Outcome of twins.

	Twin 1		Twin 2		P value
	Frequency	Percent	Frequency	Percent	
Discharged	72	96.0	69	92.0	0.601
Death RDS	2	2.7	3	4.0	
Death septic shock	0	0	2	2.7	
Death RDS septic shock	1	1.3	1	1.3	
Total	75	100.0	75	100.0	

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DISCUSSION

Incidence of twin pregnancy is on increasing trend due to increase in assisted reproductive technology. Regardless of the efforts the improve well-being of the second twin, due to intra-partum events the outcomes are still not well established due to conflicting data.

A study by Konar H et al,[10] majority of the women were aged between 20 to 29years of age. A study by Joshi et al,[11] mothers (88.3%, n=53) were in between the age of 20-34 years. (4) in our study mean age of study population was 25years.

A study by Srivastava et al,[12] showed that 71.11% preterm delivery and most women delivered at the gestational age between 32-36 weeks. A study by Shobha T et al, mean gestational age at delivery was 35.6 +/- 2.73 weeks. As multiple perinatal outcomes depends on pre-maturity of the neonates, it is important to prevent pre-mature delivery. Less gestational age at delivery plays a major role as the risk of neonatal death is higher in prematurity.

A study by Konar H et al,[10] Nine unbooked cases were referred from other government hospitals. Author also concludes that perinatal outcome among unbooked cases is poor.A study by Rizwan N et al,[13] majority of women 52 (81%) were un-booked and only 12 (18%) were booked. In the present study, majority were booked cases. Followed up booked cases have predictable outcomes with preparedness to possible mode of delivery.

A study by Konar H et al,[10] the proportion of multigravida women was more than two times higher than that of primigravida women. In our study, majority of the women had primigravida followed by multigravida. Increased parity is known to increase the risk of dizygotic twins. A study by Joshi et al,[11] 41.6% (n=25) of them were nullipara followed by 35% (n=21) being primipara

Chorionicity: A study by Shobha T et al,[14]73.3% of them were DCDA, 16.6% were MCDA, 10% were MCMA. A study by Joshi R et al,[11] Majority of the pregnancy (58.3%, n=35) were dichorionic diamniotic (DCDA). In the present study, 72% had DCDA and 28% had MCDA. Chorionicity is important as the studies have shown that, there is difference in perinatal outcome associated with DCDA ana MCDA.

Comorbidties: A study by Shobha T et al,[14] incidence of preeclampsia was high, followed by PPROM, GDM and anaemia. A study by Konar H et al,[10] Most common maternal complication noted was preterm labor (64.28 %). Other complications encountered were preeclampsia, antepartum hemorrhage, preterm labor, preterm premature rupture of membrane, and cord prolapse.

Twin characteristics: Birth weight association among twins. Twin pregnancy is more likely to be characterized by LBW than singleton pregnancy mostly due to fetal growth restriction and preterm delivery. A study by Konar H et al,[10] The percentages of VLBW (\1500 g) and LBW (1500–\2500 g) babies were higher among the second twins compared to the first twins.

Inter-delivery time association among twins: A study by Joshi R et al,[11] Most of the second twins (91.7%, n=55) were delivered within 30 minutes. Mean inter-delivery interval was 15.1±10.733 minutes in our study.

APGAR score at 1minute and at 5 minutes association among twins

A study by Shobha T et al,[14]apgar score of > 7 is seen in 76 % in first twin and 73 % in second twin. There is no statistically significant difference between the apgar score at 1minute of second twin in comparison with first twin.

A study by Shobha T et al,[14]apgar score at 5mins is higher (9.3 %) when compared to first twin which is statistically significant with p value < 0.05.(3) A study by Joshi R et al,[11] low Apgar score in the second twins.

Twin presentation association among twins

Intrapartum management of twins is strongly influenced by their presentations in labor. An integral part of preparing for delivery in case of twin pregnancy is the confirmation of presentation so that the route of delivery can be decided. Our study showed high incidence of vertex presentation in both twin 1 and 2. Followed by 14.7% in twin 1 and 20% in twin2 had presented with breech. 2.7% of twin 2 had vertex presentation A study by Joshi R et al,[11] cephalic presentation was the commonest combination constituting 52.22%. Cephalic-Breech presentation was seen in 24.44% twins, Breech-Breech in 6.67%, Breech-Cephalic in 15.56% and Cephalic-Transverse in 1.11% twins.

Mode of delivery association among twins

A study by Srivastava S et al,[12] showed that majority of the women (72.22% in twin1 and 63.33% in twin 2) with twin pregnancy had normal vaginal delivery. A study by Shobha T et al, vaginal birth group N=593 (90.1%), 488 (82.3%) women delivered both twins vaginally, 80 (13.5%) had a CS during labor for both twins, in 25 (4.2%) a CS was done for the second twin. A study by Konar H et al,[10] the rate of LSCS delivery was 35.71 %, and that of V–C delivery was 2.86 %.A study by Joshi R et al,[11] women delivered twins vaginally, 72.22% for first twin and 63.33% for the second twin. Followed by 22% in twin1 and 31% in twin2 had assisted breech delivery.[4]Our study majority of the twin underwent vaginal delivery, followed by LSCS and assisted breech. 2 cases caesarean section was done for second twin who failed for internal podalic version. This information should be used to help counsel women with twin pregnancies regarding mode of delivery.

NICU admission association among twins

A study by Srivastava S et al,[12] the second twin required NICU admission (21 versus 18) more often than the first twin. There were 40 NICU admissions, (22.72%) out of which 47.5% (n=19) were for the first twin and 52.5% (n=21) for the second twin. A

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study by Joshi R t al, 30% (n=18) of the second twins and 25% (n=15) of the first twins required admission to neonatal intensive care unit, and was not statistically significant (p=0.508).[4]A study by Hanumaiah et al,[15] in India where very low birth weight was the leading cause for neonatal admission followed by respiratory distress and birth asphyxia.In the present study, 44% in twin 1 and 62.66% in twin 2 had NICU admission. In our study as the majority of the infants had late pre-term delivery, this could be contributing factor for the increased NICU admission in twins.

Outcome of delivery association among twins

A study by Shobha T et al,[14] 8 (25.8%) and 13 (41.9%) occurred in first and second twin respectively and 10 (32.3%) occurred in both the twins.A study by Joshi et al, Perinatal mortality was 28.3%. Higher rate perinatal mortality rate in second twin (16.7% vs. 6.7%).[4] Rizwan N et al,[13] study found that common cause of neonatal death was very low birth weight (in 32.8% cases), followed by sepsis and jaundice.A study by Hanumaiah I et al,[15] Perinatal mortality observed in this study was 15.2%. Perinatal mortality was more on the second twins (21.7%, n=13). In the present study, 4% in twin 1 and 8% in twin 2 experienced mortality. Overall increased in mortatlity in the second twin could be due to higher susceptibility of the second born twin to hypoxia, sepsis and respiratory distress.

CONCLUSION

Mean inter-delivery interval was 15.1±10.733 minutes. APGAR score at 1 minute and 5minutes were significantly less in twin 2 compared to twin 1. Commonest presentation was vertex presentation both in twin 1 and 2(85.3% and 77.3% respectively). Commonest mode of delivery was vaginal delivery in both twin 1 and 2 (78.7% and 70.7%), followed by LSCS (13.3% and 16% respectively). Twin 2(62.66%) had higher NICU admission rate compared to twin 1(44%). Common reasons for NICU admission was respiratory distress, low birth weight and neonatal jaundice. Perinatal mortality was 4% in twin 1 and 8% in twin 2.

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