

The Management of Second Twin and its Perinatal Outcome in Comparison with First Twin

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Abstract: *AIM: To study the management of second twin and its perinatal outcome in comparison with first twin in Modern Govt. Maternity Hospital. OBJECTIVES: The present study has been undertaken to study the influence of following factors on the perinatal outcome of second twin in comparison with first twin: Chorionicity, Gestational age. Presentation of twins, Mode of delivery, Birth weight, Birth interval. RESULTS: 150 twin pregnancies that were delivered in MGMH, Hyderabad were considered and the following analysis was done. There was one twin to twin transfusion syndrome, one cord entanglement which were included in the study. On analysis, the 150 twin cases the following results were obtained: In twin 1, 88.1% of DC and 67.5 %of MC had LBW, 1.8% of DC and 10% of MC had VLBW ; 10% of DC and 15% of MC had birth weight of >2.5 kg with p value of 0.39. It was statistically insignificant. In twin2, 84.5% of DC and 75% of MC had LBW, 3.6% of DC and 25% of MC had VLBW and 11.8% of DC and 10% of MC had birth weight >2.5 kg. It was statistically insignificant. CONCLUSION: The perinatal outcome of the second twin was poor when compared to the first twin. Poor perinatal outcome in terms of low apgar score at 5 minutes, NICU admissions, neonatal deaths were more in second twin. This may be due to increased prematurity, low birth weight, birth asphyxia and mal presentations in twins. More complications are expected for the second twin compared to the first. Strict intrapartum monitoring, availability of expert obstetrician to conduct delivery along with good neonatal intensive care facilities are crucial in improving the perinatal outcome.*

Keywords: Multiple Pregnancies, Perinatal Mortality and Morbidity, Prematurity, Fetal Growth Restriction and Low Birth Weight

1. Introduction

The incidence of twin pregnancies has shown a significant increase over the last decades due to the advent and widespread use of the assisted reproductive technology¹. Inherent complications of multiple pregnancies are high risk of perinatal mortality and morbidity coupled with maternal complication and socio-economic problems¹.

Between 1980 and 2005, the twinning rate rose from 18.9 to 32.1 per 1000 livebirths. Over the period of time, the number of live births from twin deliveries rose nearly 50 percent, and the number of higher-order multifetal births increased more than 40 percent¹. Although twins occur in approximately 1 in 80 pregnancies corresponding to 2.6% of all newborns, they account for 12.2% of preterm births and 15.4% of neonatal deaths².

The main causes of adverse neonatal outcomes in multiple pregnancies are related to prematurity, fetal growth restriction and low birth weight. In addition, these pregnancies are prone to complications inherent to twinning, such as acardiac fetus, conjoined twins and twin-twin transfusion syndrome. In addition, the risk of congenital anomalies is about 1.7 times higher than among singleton pregnancies and is more significant in monozygotic pregnancies². Monochorionic twin pregnancies have a three to five-fold higher perinatal morbidity and mortality compared with dichorionic twin pregnancies.³Of the two twins, second twin has always been said to be at a greater risk of birth asphyxia and poorer outcome. This is more in monozygotic twins. The second twin has also been sited to have poorer outcome in view of higher incidence of mal-presentations, also a time interval of more than 30 minutes between the delivery of first and second twin is related to poor outcome.

With a view to evaluate the affect of the chorionicity, gestational age, mode of delivery, birth weight, birth interval between the twins on apgar scores and survival of second twin in 150 cases, this study of management of second twin and its perinatal outcome in comparison with first twin was undertaken.

2. Methodology

Place of Study

This study was conducted in Modern Government Maternity Hospital, Petlaburz, Osmania Medical College, Hyderabad.

Period of Study:

January 2013 to August 2014

Study Design:

Prospective and a comparative study.

Sample Size: 150 twin pregnancies.

Inclusion Criteria: Twins from 28weeks of gestation regardless of birth weight were included in the study.

Exclusion Criteria: Triplets / quadruplets, Less than 28weeks of gestation.

3. Results

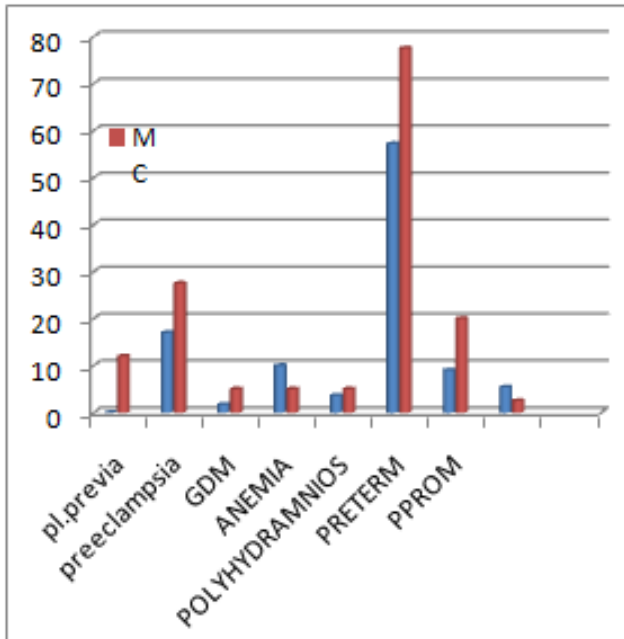
150 twin pregnancies that were delivered in MGMH, Hyderabad were considered and the following analysis

was done. There was one twin to twin transfusion syndrome, one cord entanglement which were included in the study.

On analysis, the 150 twin cases the following results were obtained:

Total number of deliveries - 7000
 Total number of twins- 150
 Incidence of twins – 2.1 %

Antenatal Complication in Twin Pregnancy According to Chorionicity



In our study of 150 twin pregnancies the most common antepartum complication observed was preterm labour found in 63 (57.2 %) of DC and 31 (77.5%) of MC.

Table 1: The Twin Specific Complications According to their Chorionicity

Twins specific complications	DC (N=110)		MC (N=40)	
	N	%	n	%
Twin-twin transfusion syndrome	0	0%	1	2.50%
Discordant Twins	0	0%	1	2.50%
Acardiac Twins	0	0%	0	0%
Single IUID	3	2.70%	2	5%
Congenital anomalies	0	0%	1	2.50%

In our study this table represents only 1 case of TTTS was observed in MC twin (2.5%), 5 cases of single IUID was found.

Table 2: Fetal Outcome in Terms of Apgar Score At 5 Min According To Their Chorionicity

Twin	Chorionicity	Apgar at 5 min		Total
		<7	>=7	
Twin 1	DC	28	82	110
		25.4%	74.5%	100.0%
	MC	8	32	40
Twin 1		20 %	80 %	100.0%
	Total	36	114	150
		24.0%	76.0%	100.0%
Twin 2	DC	27	82	110
		26 %	74%	100.0%
	MC	14	26	40
Twin 2		35%	65%	100.0%
	Total	41	109	150
		27	73%	100.0%

In twin1, 74.5% of DC and 80% of MC had good apgar at 5 min with p value of 0.48 which was statistically insignificant.

In twin 2, 74.5% of DC and 65% of MC had good fetal outcome at 1 min with p value of 0.2. Chorionicity has no statistical significant difference on apgar scores of both twins.

Table 3: Comparison of 1 Minute Apgar Scores Between First and Second Twin

TWIN	APGAR SCORE	
	< 7	>7
TWIN 1	36	114
%	24%	76%
TWIN 2	41	109
%	27%	73%

This table represents 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.

Table 4: Comparison of 5 Minute Apgar Scores Between First and Second Twin

TWIN	APGAR SCORE	
	< 7	>7
TWIN 1	5	145
%	3.3%	96.6%
TWIN 2	14	136
%	9.3%	90.6%

This table represents that the % of second twins showing poor apgar score at 5mins is higher (9.3 %) when compared to first twin which is statistically significant with p value < 0.05.

4. Discussion

This study was conducted with the aim to observe the management of second twin and its perinatal outcome of second twin in comparison with first twin.

The incidence of twin pregnancy was 2.1% in our institute.

100% had spontaneous conception. 73.3% of them were DCDA, 16.6% were MCDA, 10% were MCMA.

In a retrospective study by Assuncao R A et al, between Jan 2003-Dec 2006 Involving 289 twins, the incidence of twin gestation was 3.4%. 60.4% DCDA, 30.8% MCDA, 6.6% MCMA and 2.1% had unknown chorionicity. 96.4% had spontaneous conception.

In our study the most common antepartum complication was preterm labour and observed in 57% of DC and 77 % of MC which was statistically significant. The incidence of preeclampsia in our study was very high compared to all other studies, it was 17 % in DC and 27% in MC. PPRM was seen in 9% of DC and 20% of MC. Other complications like GDM and Anaemia in 1.7% and 10.0% of DC whereas 5 % and 5 % of MC.

In a retrospective study of 291 cases of twins at Ilorin teaching hospital over a 5 year period by Isiaka lawal et al, 34.9% had preterm labour, 8.6% had preeclampsia, 2.4% had anaemia and 1.7% had PPH.

In Babay Z A et al study, 18.2% had premature labour, 11.9% had anaemia, 3.6% had IUFD, 2.6% had placenta previa and 2% had gestational hypertension. PPH was seen in 8.5% of twins with p value of 0.0065 which was statistically significant. Congenital anomalies were seen in 0.8%.

In our study mean gestational age at delivery was 35.6 +/- 2.73 weeks. 12% of cases delivered between 28-32weeks, 50.6% cases delivered between 33-36weeks and 37.3% cases delivered at and after 37weeks.

A retrospective study of 188 twin pregnancies conducted by Anahita et al reported that the period of gestation at onset of labour varied between 24 – 41 weeks, average being 33 weeks and only 38.29% continued beyond 37 weeks of gestation.⁴⁶

In Lam et al studies comparing pregnancy outcome between high order multiple and twin pregnancies at Hong Kong, preterm deliveries occurred in 95% of High order multiple pregnancies (20 of 21 deliveries), while preterm labour occurred in 39% of twin pregnancies (15 of 38 pregnancies). The mean gestational age at delivery was 32.9 weeks.

In our study, discordant growth was the most common twin specific complication.

TTTS was seen in 0% of DC and 2.5 % of MC. A single case of twin twin transfusion syndrome was seen among MC twins. This suggests that it is a complication specific to MC twins or occurs more common with it. 5 Cases had single IUFD; 3 out of 110 cases in DC and 2 out of 40 cases in MC. 1 cases of congenital anomalies (1 MC).

In a retrospective study by Assuncao R A et al, 3 cases of acardiac twin and 10 cases had conjoined twinning. Single IUFD was seen in 6.6%. Congenital anomalies were observed in 12.8% cases.

In our study, 57.2% of DC and 77.5% of MC twins had preterm delivery and 42.8% of DC and 22.5% of MC had term delivery. In the preterm deliveries, 50% had delivery between 33- 36weeks gestation and 12. 10 % had delivered < 32 weeks, preterm deliveries were more common in MC it had statistical significance with p value < 0.05 (0.03).

In a retrospective study by Assuncao R A et al, the mean gestational age at delivery was 34.6weeks. According to chorionicity, mean gestational age at delivery was lower in monochorionic pregnancies compared to dichorionic. The proportion of twins born before 32 weeks was 2.5 times higher among monochorionic than dichorionic (30% versus 13%) and was statistically significant

In our study majority of twins, 56% had vaginal delivery and cesarean section either elective or emergency 44 %.. The most common indication for cesarean section was noncephalic presentation. The most common mode of presentation was cephalic-cephalic presentation (44%), least common transverse lie (6%).

In the study by Roshni radhakrishnan 62.5% delivered vaginally, 35.5% delivered by cesarean section and 2% had abdomino-vaginal delivery. In the absence of other obstetric indications for caesarean delivery, vaginal delivery should be planned in all.

cases of vertex-vertex presentation, irrespective of gestational age (6). 27.5% had required emergency cesarean section and 8% delivered by elective cesarean section.

In our study mode of delivery had no statistical significant difference in perinatal outcome of second twin in comparison with first twin p value 0.8.

Ji Young Kwon et al study the differences of umbilical arterial gas parameters between twin siblings showed no significant difference according to the mode of delivery. With regard to the 1 minute and 5 minute apgar scores, the differences between twin siblings are significantly increased in vaginal delivery group compared to cesarean delivery group (p=0.048, and p=0.038, respectively). In comparing the 28 cases delivered vaginally with an inter-twin delivery interval <10 minutes and 40 cases delivered by cesarean section, no significant differences were observed in the umbilical arterial gas parameters and apgar scores and concluded that the inter-twin umbilical arterial blood gas parameters according to the mode of delivery showed no difference. For twin deliveries, it is relatively safe to plan for a vaginal delivery, but an effort should be made to reduce the inter-twin delivery interval time.

Stephanie de Haseth et al the study (2012), 1352 twins were born in the two participating institutions, of which 658 twins fulfilled the inclusion criteria. An elective cesarean section (CS) was performed in 65 (9.9%) women. In the planned 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.

Neonatal morbidity was 116/658 pregnancies, or 16 children (16/130=12.3%) in the elective CS versus 100 (100/1316=7.6%) for the planned vaginal births ($p>0.05$); the results do not support an elective caesarean section for twin gestations ≥ 32 weeks when twin A is presented in vertex position.

In our study of 150 cases, there was a high incidence of mal-presentations 66 % at time of delivery. Most common was cephalic- cephalic 44%, cephalic- breech was 16%, breech – cephalic was 14 %, breech – breech was 14 % and transverse – breech was 0.6 %.

In a study by Roshni Radhakrishnan there was a high incidence of mal-presentation at the time of delivery in twin gestation. The most common presentation in the present study was vertex- vertex (48%). Next common is vertex-breech in 44cases (22%).

In the study of Anahita et al frequency of presentation was Vertex-Vertex in 57.55%, Vertex-Br in 34 cases (18.08%) and breech–vertex in 10.6%.

In Babay Z A et al study, the incidence of vertex-vertex among the multiple pregnancy cases in labor were 38.2%, vertex-breech was 35%, breech-breech was 11.5% and breech-vertex was 11.5%. Transverse lie of the second twin was found in 3.8%.

In our study most common presentation of twins is cephalic – cephalic constituted for 44 % followed by cephalic – breech and breech- breech 16 % each and there was no statistical significance difference between various presentations and perinatal outcome of second twin with that of first twin.

Joshua P Vogel et al (2014)1, 424 twin pregnancies were included, 25.9% of these had a non-vertex second twin and Caesarean was more common in non- vertex presentations (6.2% vs 0.9%, $p<0.001$) After a vaginal delivery of a vertex first twin, non-vertex presentation of the second twin is associated with increased odds of apgar <7 at 5 minutes, but not of other maternal or perinatal outcomes. Presentation of the second twin is not as important a consideration in planning twin vaginal birth as previously considered.

In our study the mean birth interval in was 10.55 with standard deviation of 14.01 94.1% of cases had birth interval of < 30 mins, 4.9 % had birth interval of > 30 mins.The maximum birth interval was 80mins and minimum interval is 1min. Increased birth interval had no effect on apgar and fetal outcome of second twin. No statistical difference was noted of apgar score between both, p value was 0.3 and 0.4 for apgar < 7 and > 7 .

In Isiaka lawal et al study, 89% had birth interval between the first and the second twin of less than 30 min, while the remaining 32 (11%) had interval of greater than30 min.

Susanne Schneuber et al (2011) evaluated 207 twin deliveries >34 weeks of gestation to examine the effect of twin-to-twin delivery time (TTDT) on neonatal outcome.

Concluded that Increasing TTDT was not associated with adverse fetal outcome. Expectant management of the second twin appears possible and elapsed time alone does not appear to be an indication for intervention.

In our study, in twin1, 11.3% had birth weight of >2.5 kg, 82.6.% had LBW and 6% had VLBW. Similarly in twin 2, 6.7% had birth weight of >2.5 kg, 62.2%had LBW and 31.1% had VLBW. Most of them were in LBW category. There was no statistical significance between MC and DC in birth weight of both the twins.

In Babay Z A et al study, the incidence of VLBW was 12.1% for the first twin, 15.4% for the second twin. The incidence of LBW was 45.6% for the first twin and 48.35% for the second twin. It was statistically significant.

In our study the mean birth weight for first twin was 2.15 kg with SD of 0.40 and mean birth weight of second twin was 1.99 with SD of 0.48.

In Isiaka lawal study, the overall mean birth weight of babies in this study was 2.5 kg+ 0.52; for the first twins had an average weight of 2.48 kg + 0.52 and the second 2.52 kg + 0.54.

In Erdemoglu E et al study, the only significant interaction affecting first and fifth minute apgar scores of both the twins was birth weight <1500 gms. The mode of delivery and presentation did not affect the apgar scores significantly.

Table 5: Comparison of Our Study with Closely Related Study

	Roshni Radhakrishnan Study	Our Study
Preterm	45 %	62.5 %
Common Mode of Delivery	Vaginal 62.5 %	Vaginal 56 %
Common Presentation	Cephalic- cephalic 57 %	Cephalic- cephalic 44 %
Mean Birth Wt. of 1 st Twin	2.09kg	2.15kg
Mean Birth Wt. of 2 nd Twin	2.03kg	1.99kg
Perinatal Deaths	1 st twin	9 %
	2 nd twin	13 %
		6.6 %
		10 %

In our study, among DC 93.6% had no neonatal complications, 6.3% twins expired. Among MC 85 % had no perinatal complications, 15 % twins expired with a statistically significant with p value of 0.01.

In our study, among twin1, 74.5% had poor fetal outcome at 5 min in DC group and 80% had poor outcome at 5 min in MC group. In twin 2, 74.6% had poor outcome at 5 min in DC group and 65% had poor fetal outcome at 5 min in MC group.

PA Hatkar et al (1999) concluded that perinatal outcome of twins is influenced by the type of placentation. Antepartum diagnosis of the type of placentation would

help in identifying the twins at risk for twin-to-twin transfusion syndrome, discordant growth, and thus associated with greater perinatal mortality. Identifying twins with severe discordancy antenatally would also help to decrease the perinatal mortality by ensuring good antenatal care, strict intrapartum monitoring and experienced obstetricians to conduct the delivery with good neonatal intensive care.

In our study there was total 76 twins admitted to NICU; among that first twin were 31 (21 %) and 45 (30.6%) were second twin. 26 perinatal deaths were observed among 147 twins, 10 and 16 occurred in first and second twin respectively. NICU admissions and perinatal deaths were more in second twin compared to first twin.

In Roshni radhakrishnan study, NICU admissions were more for second of twin, 28.5% compared to 23% for first of twin. The most common cause of admission to NICU was prematurity followed by low birth weight, IUGR and birth asphyxia. The perinatal outcome of the second twin was poor when compared to the first twin. Poor perinatal outcome in terms of macerated births, neonatal deaths and NICU admissions were more in second twin. This may be due to increased prematurity, low birth weight, birth asphyxia and mal-presentations in twins.

In Isiaka lawal study, there were 31 perinatal deaths in this study among 291 twins.

8 (25.8%) and 13 (41.9%) occurred in first and second twin respectively and 10 (32.3%) occurred in both the twins. Majority of the deaths (67.7%) occurred in preterm fetuses, while 10 (32.3%) were term infants.

In our study apgar score of > 7 is seen in 76 % in first twin and 73 % in second twin. There is no statistically significant difference in the apgar score at 1 minute of first and second twin.

The limitations of this study are that it is a tertiary hospital based study. The neonatal outcome was not able to follow in few of the cases as the neonates were shifted to outside.

5. Summary & Conclusions

From our study, the incidence of twin gestations was 2.1%. The twin gestation continues to be the high risk despite advances in obstetric and perinatal care and facilities. In our study preterm labor was the commonest complication observed. Some of the complications twin twin transfusion syndrome though very rare, occurred in our study in single cases of MCDA group;

- The most common ante partum complication was preterm labour and is seen in 57% of DC and 77.5% of MC. Majority of preterm deliveries occurred in MC with a statistical significant value p value 0.03.
- Mal presentations was seen in 66% of twin pregnancy. The Majority of twins in our study had vaginal delivery 54%.
- Perinatal deaths are common in monochorionic twin with statistical significant p value of 0.01.

- Birth weight was important factor in the perinatal outcome, outcome was poor for both twins weighing < 1500gms both the twins.
- Presentation of twins, Mode of delivery and birth interval between twins has no affect on perinatal outcome in second twin in comparison with first twin.
- Perinatal mortality was higher in second twin (10 %) compared to first twin (6.6 %) but was not statistically significant.
- The second twin outcome in terms of NICU admissions and poor apgar scores at 1 minute was more compared to first twin and did not show any statistical significance.
- Apgar score at 5 minutes between first and second twin has shown statistical significance difference.

6. Conclusion

The perinatal outcome of the second twin was poor when compared to the first twin. Poor perinatal outcome in terms of low apgar score at 5 minutes, NICU admissions, neonatal deaths were more in second twin. This may be due to increased prematurity, low birth weight, birth asphyxia and mal presentations in twins. More complications are expected for the second twin compared to the first.

Strict intrapartum monitoring, availability of expert obstetrician to conduct delivery along with good neonatal intensive care facilities are crucial in improving the perinatal outcome.

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