Original Article

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Perinatal Outcome of Second Twin with Respect to Mode of Delivery: An Observational Study

Obstetrics and Gynaecology Section

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ABSTRACT

Introduction: With the advent of assisted reproductive techniques, multi-fetal pregnancies are on the rise. While caesarean section is the defined mode of delivery for triplets and higher order pregnancies, the picture for twin delivery is not so clear. While a trial for vaginal delivery is attempted, the second twin is considered vulnerable to complications. Whether this translates into worsened perinatal outcomes is not well defined.

Aim: To study the perinatal outcome and to identify the various factors influencing the perinatal outcome of second twin with respect to mode of delivery.

Materials and Methods: Data was collected from hospital birth records regarding the mode of delivery of viable twins (period of gestation >28 weeks) and outcome of second twin with respect to APGAR scores, NICU stay, neonatal morbidity and mortality, over a period of 12 months.

Results: Of the 93 pairs of twins delivered, in 21(22.6%) pregnancies both twins were delivered vaginally, in 70(75.2%) pregnancies both were delivered by caesarean section and in 2 (1.8%) pregnancies 1st twin was delivered by vaginal route and 2nd by caesarean. In the vaginal delivery group, 85.7% times both twins were in vertex position. In the caesarean group, vertex/non-vertex (38.57%) was the most common presentation followed by non-vertex /non-vertex (25.71%) and vertex/vertex (24.28%). Comparing the perinatal outcome of second twin in both groups, the odds for APGAR score ≤7 was 3.385 times (OR-3.384, 95% CI 1.2099- 9.4684, p=0.02) in the vaginal group compared to the caesarean group. There was no association (OR-1.054, 95% CI 0.3344- 3.3268, p=0.9) between neonatal morbidity of second twin compared to mode of delivery. All 3 perinatal deaths were in the vaginal group (all between 28-32 weeks of gestation).

Conclusion: There is an increased preference for caesarean delivery in twin pregnancies except in cases where both the twins are in vertex position and not associated with any other maternal or fetal complication. However, the caesarean mode of delivery does not influence neonatal morbidity in second twin, except when the 1 minute APGAR score is ≤7.

Keywords: Assisted reproductive techniques, Fetal, Twin pregnancy, Vaginal delivery

INTRODUCTION

As the field of assisted reproductive techniques are making a continual progress it raises hopes for childless couples. Alongside, it also increases nightmares for the obstetrician due to the increased numbers of multi-fetal pregnancies [1,2]. These multi-fetal pregnancies are accompanied by their own set of adverse perinatal outcomes compared to singleton pregnancies, where the second twin is at a higher risk than the first one [3-5]. While caesarean section is the preferred mode of delivery for triplets and high order pregnancies, the course for term twin pregnancies is not so well-defined. Yang et al., highlighted that, the previously followed guideline of planned caesarean delivery for all twin pregnancies is flawed because it was based on expert opinion rather than clinical trials [6].

There is a definite rise in rates of elective caesarean delivery for twins' inspite of a lack of substantial evidence. Hence, it is important to identify the various factors which influence the decision regarding the mode of delivery of twins, in order to address this increasing rate of caesarean section.

In this study, we analysed the trend of twin delivery and perinatal outcome of second twin with respect to mode of delivery, in a tertiary care center in Mumbai.

MATERIALS AND METHODS

A prospective observational study was carried out at Nowrosjee Wadia Maternity Hospital for a period of 1 year from June 2013 to May 2014. Total of 93 pregnant women carrying twins were studied.

Inclusion criteria: Pregnant women carrying twins with gestational age >28 weeks, conceived spontaneously or with treatment.

Exclusion criteria: Pregnancies with triplets and higher order multi-fetal pregnancies or pregnancies with amnio-reduction and selective fetal termination done in early pregnancy.

After Institutional Review Board approval, all twin pregnancies presenting for delivery, were enrolled for the study. Data was collected from hospital birth records regarding maternal age, parity, whether spontaneous or assisted conception, gestational age whether full term or preterm. History and examination was done to confirm any obstetric risk factors like pregnancy induced hypertension/ chronic hypertension, overt or gestational diabetes mellitus, hypothyroidism and obstetric history, preterm pre-mature rupture of membranes and anaemia. Presence of fetal high risk conditions like intra-uterine growth restriction, twin growth discordance, fetal anomaly, abnormal colour doppler flows, cord prolapse, fetal distress and meconium stained liquor was also noted. Presentation of both twins was noted. Mode of delivery of the twin pair, i.e., whether vaginal or caesarean delivery was noted. Perinatal outcome in terms of 5minute APGAR score <7, morbidity like asphyxia, sepsis, fracture, respiratory distress syndrome and mortality was noted. Mode of delivery was compared with presentation of twins, presence of risk factors (obstetric or fetal), 5 minute APGAR score <7, morbidity like asphyxia, sepsis, fracture, respiratory distress syndrome and mortality. Twin to Twin delivery time in the vaginal group was also noted.

STATISTICAL ANALYSIS

Statistical analysis was done by descriptive methods (such as percentage calculation) and calculation of Odds Ratio. Since, this was an exploratory study, no sample size calculations were performed. Analysis was performed using GraphPad Prism 6® (GraphPad Inc., USA).

RESULTS

A total of 93 consecutive twin pregnancies fulfilling the inclusion criteria were studied as a part of a pilot study. The mean maternal age was 28.3±4.05 years (range 20-40 years). Considering the gestational age, 58 (62.3%) twin pregnancies delivered preterm, while 35 (37.7%) delivered at term. A total of 57 (61.2%) twin pregnancies were conceived using assisted reproductive technology while 36 (38.8%) twin pregnancies were conceived spontaneously. A total of 42 (45%) twin pregnancies had associated maternal and fetal complications, while 51 (55%) were non-complicated.

Out of the total 93 twin pregnancies, in 21 (22.6%) pregnancies both twins were delivered vaginally, in 70 (75.2%) pregnancies both were delivered by caesarean section and in 2 (1.8%) pregnancies first twin was delivered by vaginal route and second by caesarean delivery. These two pregnancies where the first twin was born by vaginal route and the second by caesarean were not included in further analysis, for comparing the morbidity and mortality of the second twin with respect to the mode of delivery.

[Table/Fig-1-3] show the fetus positions, maternal and fetal complications and the APGAR score of the second twin. The vaginally delivered second twin scored an odds of 3.384, of having an APGAR ≤7 than those delivered by caesarean section (OR= 3.384, CI=1.2099-9.4684, p=0.0202). This was found to be statistically significant. Regarding the neonatal morbidity the results were not found to be statistically significant (OR=1.054, CI=0.334-3.3268, p=0.9276).

In vaginal group there were total 3 neonatal mortalities (all were born preterm i.e., <37 weeks of gestation, one twin pair was 29 weeks where both babies died, while other was 30 weeks where one baby died and the other survived) whereas, the caesarean group had none [Table/Fig-4].

	Vaginal Group	Caesarean Group
Both twins in vertex	18 (85.7%)	17 (24.28%)
1st twin vertex, 2nd non-vertex	2 (9.5%)	27 (38.57%)
Both twins non-vertex	1 (4.7%)	18 (25.71%)
1st twin non-vertex, 2nd vertex	0	8 (11.42%)

[Table/Fig-1]: Position of the fetuses in the two groups.

	Vaginal Group	Caesarean Group
Associated with maternal and fetal complications	2 (10%)	40 (57%)
Not associated with maternal and fetal complications	19 (90 %)	30 (43%)

[Table/Fig-2]: Associated maternal and fetal complications in the two groups.

	Vaginal Group	Caesarean Group
2nd twin APGAR ≤ 7	14 (66.6%)	26 (37%)
2nd twin APGAR >7	07 (33.3%)	44 (63%)

[Table/Fig-3]: APGAR score of second twin in the two groups.

	Vaginal Group	Caesarean Group
Neonatal morbidity present	5 (23.8%)	16 (22.6%)
No neonatal morbidity	16 (76.2%)	54 (77.4%)

[Table/Fig-4]: Neonatal morbidity (asphyxia, sepsis fracture and respiratory distress syndrome).

DISCUSSION

As assisted reproductive technology makes ongoing inroads into the spectrum of options for childless couples, it brings with itself the increased rates of twins and higher order multifetal pregnancies [1,2]. Twins have worse perinatal outcomes as compared to singletons [3,4]. Furthermore, evidence suggests that, the second twin is at increased risk of perinatal morbidity at all gestational ages [5], due to intra-partum complications (cord prolapse, abruption, fetal distress, prolonged second stage of labour, increased intertwine delivery time etc.,) [6,7].

While general consensus guides that, vaginal delivery for twins is safe with both twins in vertex presentation, whereas, an elective caesarean section is reserved for non-vertex presentation of the first twin [8,9]. Yang et al., pointed out that this consensus is based on expert opinion rather than randomized clinical trials [6]. Hence, the optimal mode of delivery for twins remains controversial.

Though several cohort studies pointed out that, there was a reduced risk of adverse perinatal outcomes for both twins or for second twin if delivered by caesarean section [10-13], the Twin Birth Study, a randomized control trial showed that, planned vaginal birth was not associated with an increase in adverse outcome compared to a caesarean section and that presentation of the second twin after delivery of the first twin did not influence the primary outcome [14].

However, despite the lack of evidence in favour of an elective caesarean delivery for twins, the rates of elective caesarean section for twins have increased worldwide [15,16].

In a meta-analysis conducted by Rossi et al., they found that, if both twins were in vertex presentation there were no differences in the outcome of the second twin after vaginal or caesarean delivery. However, in 1st vertex and 2nd non-vertex presentation, a trial of vaginal delivery is safe only in the absence of other risk factors [17]. In our study, in the group of twins delivered vaginally, in a majority both were vertex and were not associated with any maternal or fetal complications. In the caesarean section delivered group of twins, in a majority of cases at least one twin was non vertex or was associated with some maternal or fetal complication.

Vogel et al., conducted a secondary analysis of the WHO Global Survey on Maternal and Perinatal Health (WHOGS) and highlighted that, there was no significant increase in maternal and perinatal outcomes associated with non-vertex presentation of second twin [18]. However, they noted a small increase in the odd of APGAR score ≤7 at 5minutes for non-vertex presenting second twins. They also found that the mortality and NICU admission were not significantly higher with a non vertex presentation. Thus, in the absence of a significantly increased rate of still birth and early neonatal morbidity/mortality, this may point that the presentation of second twin is not as important a prognostic feature as was previously believed.

In our study, we found that, the odds of APGAR ≤7 are 3.3 times in the second twin in the vaginal group compared to the CS group, this was also found to be statistically significant. However, no difference was found in the odds for morbidity irrespective of the mode of delivery. There were a total of 3 mortalities of second twin in the vaginal group, none in the caesarean section group. However, an important point to note was that all 3 deaths were in very preterm neonates 28-32 weeks of gestation with extremely low birth weights, where the first twin had also suffered major morbidity or mortality.

We believe that, the decision for the mode of delivery in twin pregnancy is crucial and has to be made taking into account each individual case.

LIMITATION

The index study has a number of limitations such as small sample size and it has been conducted at a single centre. In addition, obstetrician expertise at and various complicated vaginal deliveries and maneuvers may influence the individual decisions regarding the mode of delivery.

CONCLUSION

Rates of caesarean delivery for twins appear to be high, especially in ones with any one twin non-vertex and other associated risk factors. Vaginal delivery is preferred in twins only if both twins vertex and there are no associated maternal or fetal risks. Though initial APGAR scores may be low, this may not translate into other serious neonatal morbidity in the vaginal group.

REFERENCES

[1] Wilcox LS, Kiely JL, Melvin CL, Martin MC. Assisted reproductive technologies: Estimates of their contribution to multiple births and newborn hospital days in the United States. *Fertil Steril*. 1996;65:361-66.
[2] Bergh T, Ericson A, Hillensj T, Nygren KG, Wennerholm UB. Deliveries and children born after in-vitro fertilisation in Sweden 1982-95: A retrospective cohort study. *Lancet*. 1999;354:1579-85.
[3] Kiely JL. The epidemiology of perinatal mortality in multiple births. *Bull N Y Acad Med*. 1990;66:618-37.
[4] Ghai V, Vidyasagar D. Morbidity and mortality factors in twins: An epidemiologic approach. *Clin Perinatol*. 1988;15:123-40.
[5] Smith GCS, Pell JP, Dobbie R. Birth order, gestational age, and risk of delivery related perinatal death in twins: Retrospective cohort study. *BMJ*. 2002;325:1004–04.
[6] Yang Q, Wen SW, Chen Y, Krewski D, Fung KFK, Walker M. Occurrence and clinical predictors of operative delivery for the vertex second twin after normal vaginal delivery of the first twin. *Am J Obstet Gynecol*. 2005;192(1):178–84.
[7] Shinwell ES, Blickstein I, Lusky A, Reichman B. Effect of birth order on neonatal morbidity and mortality among very low birthweight twins: A population based study. *Arch Dis Child Fetal Neonatal Ed*. 2004;89:F145–48.
[8] Blickstein I. Caesarean section for all twins? *J Perinat Med*. 2000;28:169–74.
[9] Boggess KA, Chisholm CA. Delivery of the non-vertex second twin: A review of the literature. *Obstet Gynecol Surv*. 1997;52:728–35.
[10] Hoffmann E, Oldenburg A, Rode L, Tabor A, Rasmussen S, Skibsted L. Twin births: Caesarean section or vaginal delivery? *Acta Obstet Gynecol Scand*. 2012;91:463-69.
[11] Smith GC, Shah I, White IR, Pell JP, Dobbie R. Mode of delivery and the risk of delivery related perinatal death among twins at term: A retrospective cohort study of 8073 births. *BJOG*. 2005;112:1139-44.
[12] Smith GC, Fleming KM, White IR. Birth order of twins and risk of perinatal death related to delivery in England, Northern Ireland, and Wales, 1994-2003: retrospective cohort study. *BMJ*. 2007;334:576-78.
[13] Armson BA, O'Connell C, Persad V, Joseph KS, Young DC, Baskett TF. Determinants of perinatal mortality and serious neonatal morbidity in the second twin. *Obstet Gynecol*. 2006;108:556-64.
[14] Barrett Jon FR, Hannah ME, Eileen K. Hutton EK, Willan AR, Allenet AC, et al. A randomized trial of planned caesarean or vaginal delivery for twin pregnancy. *N Engl J Med*. 2013;369:1295-305.
[15] Lee HC, Gould JB, Boscardin WJ, El- Sayed YY, Blumenfeld YJ. Trends in caesarean delivery for twin births in the United States: 1995-2008. *Obstet Gynecol*. 2011;118:1095-101.
[16] Arabin B, Kyvernitakis I, Liao A, Zugaib M. Trends in caesarean delivery for twin births in the United States: 1995-2008. *Obstet Gynecol*. 2012;119:657-58.
[17] Rossi A, Mullin P, Chmait R. Neonatal outcomes of twins according to birth order, presentation and mode of delivery: A systematic review and meta-analysis. *BJOG*. 2011;118:523–32.
[18] Vogel JP, Holloway E, Cuesta C, Carroli G, Souza JP, Barrett J. Outcomes of non-vertex second twins, following vertex vaginal delivery of first twin: A secondary analysis of the WHO Global Survey on Maternal and Perinatal Health. *BMC Pregnancy and Childbirth*. 2014;14:55.

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