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# Perinatal outcome of twin gestations according to mode of delivery in a tertiary centre of West Bengal (India)

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## ABSTRACT

To compare the perinatal outcomes of the late preterm and term twins according to the modes of delivery. This was a prospective observational study, carried out at the Department of Obstetrics and Gynaecology, R. G. Kar Medical College, Kolkata. 192 twin deliveries between 1st September 2009 to 31st August 2010 with gestational age of at least 34 completed weeks at delivery were included. The required sample size was calculated with an alpha level 0.05 and beta level 0.20 and it was found at least 54 twin deliveries were required.

Among 192 twin deliveries included in the study, 59.9% were delivered vaginally, 40.1% were delivered by LSCS. 23.9 % were delivered by emergency LSCS, 16.15% were delivered by elective LSCS. Among the total twin sets delivered by LSCS, 59.7% were delivered by emergency LSCS and 40.3% by elective LSCS. Significant differences were found in Apgar scores among vaginally delivered babies with those of delivered by elective LSCS. Only requirement of NICU admission was significantly higher in preterm newborns delivered by LSCS. Significant differences were found in birth weights and Apgar scores at 5 minutes after birth in the perinatal outcome of newborns delivered by Elective LSCS before 38 weeks and after 38 weeks of gestation. In the absence of significant maternal complication, it is better to deliver twins at 37 completed weeks of gestation or later, may be preferably by elective LSCS, to avoid neonatal complications.

## INTRODUCTION

Twin pregnancies present unique challenges to the modern obstetrician. It has long been recognised that the delivery of twins constitutes an area of significant risk in obstetrics. Many twin pregnancies are delivered between 34 and 37 weeks' gestation either secondary to preterm labour or obstetrical complications necessitating intervention. Perinatal mortality is five times higher in twins than in singletons [1]. Nevertheless, vaginal birth of twins at term is well recognised as a high-risk area. It is associated with increased rates of perinatal death and a depressed Apgar score, primarily because of intrapartum asphyxia of the second twin. The attempted vaginal birth of twins is, however, recognised as an area associated with specific risks [2].The preterm birth rate in twin pregnancy varies among populations from 30% to 50% [3] [4]. Prematurity is presently responsible for three-quarters of neonatal mortality and one-half of long-term neurological impairments in children [5]. The higher rate of preterm delivery of these neonates compromises their survival chances and increases their risk of lifelong disability. This issue is furthermore complicated in developing countries, where the level of neonatal intensive care is not optimal. The fact that, complications of prematurity and low birth weights are more common in these set-ups, further complicates the decision [6]. The purpose of this study is to evaluate the association of mode of delivery in twin gestations and their perinatal outcome. From this study we will get information which will enrich our present knowledge of management of twin pregnancy for betterment of its outcome. Specific objectives of this study are i) to compare the perinatal outcome of twin pregnancies delivered at 34 to < 37 weeks i.e. late preterm and at > 37 weeks of gestation according to the mode of delivery and ii) to compare the perinatal outcome among the electively delivered group and the spontaneously delivered group.

## MATERIALS AND METHODS

This was a prospective observational study, carried out at the Department of Obstetrics and Gynaecology, R. G. Kar Medical College, Kolkata, West Bengal. Twin deliveries between 1st September 2009 to 31st August 2010 with gestational age of at least 34 completed weeks at delivery, were included. Exclusion criteria were significant maternal medical disorder not related to pregnancy, intrauterine death of one foetus, congenitally anomalous foetus and twin deliveries with unknown last menstrual period (LMP) and no dating ultrasonography report. The required sample size was calculated with an alpha level 0.05 and beta level 0.20. This study was approved by the Ethical Committee of R G Kar Medical College and Hospital. Sample designing was done by grouping all the cases into two main categories: a) Twin pregnancies delivered at 34 to 36 weeks 6 days, b) Twin pregnancies delivered after 37 weeks. Among the first group twin pregnancies delivered in between 34 to 35 weeks 6 days of gestation were studied separately. Maternal informations were recorded as registration number, log number, LMP, date of admission, date and time of confinement of first and second baby, period of gestation at confinement, complications during pregnancy, complication of labour, mode of delivery, indication of elective delivery, delivery interval of first and second baby, investigation reports, and any special remark. Early ultrasound examination results were used if the dates were unreliable. In our institution twins are delivered electively only in cases which are complicated with malpresentation of the first twin, preeclampsia, oligohydramnios, fetal growth restriction (FGR). FGR was considered if the fetal weight is below the 10th percentile of gestational age [7]. Neonatal factors were recorded as birth weight, 5- minute Apgar score, Neonatal Intensive Care Unit (NICU) admission, length of hospital stay, perinatal morbidities, mortalities and any special remark. Sepsis was recorded as an outcome if it was confirmed and documented in the infant's chart.We included only the fresh still births according to our inclusion criteria.

Statistical analyses were done using the statistical software packages MedCalc® Version 10 and 11.0.1. Categorical variables were assessed by Mann-Whitney U test, Chi-squared analysis or Fisher's exact test. Changes in categorical variables across three groups were assessed by Kruskal-Wallis test. Continuous variables were reported as means ± SD and were tested using the Independent samples t-test or the One-way analysis of variance (ANOVA) with the Levene's Test for Equality of Variances and Student-Newman-Keuls test for all pairwise comparisons. All tests were two tailed. *p* values <0.05 were considered significant.

## RESULTS

During the one year study period, there were 17,083 deliveries in the Department of Obstetrics and Gynaecology at R.G. Kar Medical College. 234 sets of twins (1.37%) were born, out of which 192 sets (82%) met the inclusion criteria. When the mode of deliveries are considered, 115 sets (59.9%) were delivered vaginally (VD), 46 sets (23.9 %) were delivered by

**Table 1 :** Perinatal outcome in twins according to the mode of delivery

| Newborn data | Vaginal Delivery (115 sets) 230 newborns | Emergency LSCS ( 46 sets) 92 newborns | Elective LSCS ( 31 sets) 62 newborns | *p* value | |
|---|---|---|---|---|---|
| | | | | I Vs III | II Vs III |
| **Birth Weight (gm)** (mean ± SD) | 1875 ± 377 | 1950 ± 423 | 1875 ± 389 | NS | NS |
| **Apgar score** At 5 minutes | 7.91 ± 1.95 | 8.0 ± 2.3 | 8.45 ± 1.9 | **S** | NS |
| **NICU required** | 20 (8.7%) | 14 (15.2%) | 4 (6.5%) | NS | NS |
| **Foetal growth restriction** | 98 (42.6%) | 39 (42.4%) | 29 (46.8%) | NS | NS |
| **Sepsis** | 8 (3.5%) | 5 (5.4%) | 3 (4.8%) | NS | NS |
| **PNMR** | 10 (45/1000) | 7 (80/1000) | 3 (49/1000) | NS | NS |

LSCS = Lower Segment Caesarean Section; S = SIGNIFICANT, p value < 0.05; NS = not-significant, p > 0.05
NICU = Neonatal Intensive Care Unit PNMR = Perinatal Mortality Rate

**Table 2 :** Perinatal outcome in Preterm twins ( < 37 weeks) according to the Mode of delivery

| Newborn data | Vaginal delivery (68 sets) 136 newborns | LSCS ( 37 sets) 74 newborns | *p* value |
|---|---|---|---|
| **Birth Weight (gm)** (mean ± SD) | 1712 ± 287 | 1726 ± 364 | NS |
| **Apgar score** At 5 minutes | 7.7 ± 1.5 | 7.7 ± 2.2 | NS |
| **NICU Required** | 13 (9.6%) | 15 (20.3%) | **S** |
| **Foetal growth Restriction** | 64 (47%) | 35 (47.3%) | NS |
| **Sepsis** | 6 (4.4%) | 6 (8.1%) | NS |
| **PNMR** | 3 (22/1000) | 5 (71/1000) | NS |

LSCS = Lower Segment Caesarean Section; S = SIGNIFICANT, p value < 0.05; NS = not-significant, p > 0.05
NICU = Neonatal Intensive Care Unit PNMR = Perinatal Mortality Rate

**Table 3 :** Perinatal outcome in Term twins ( > 37 weeks) according to the Mode of delivery.

| Newborn data | Vaginal delivery (47 sets) 94 newborns | LSCS ( 40 sets) 80 newborns | *p* value |
|---|---|---|---|
| **Birth Weight (gm)** (mean ± SD) | 2111 ± 368 | 2099 ± 368 | NS |
| **Apgar score** At 5 minutes | 8.1 ± 2.4 | 8.6 ± 2.1 | NS |
| **NICU Required** | 7 (7.4%) | 3 (3.6%) | NS |
| **Foetal growth Restriction** | 34 (36.2%) | 33 (41.2%) | NS |
| **Sepsis** | 2 (2.1%) | 1 (1.3%) | NS |
| **PNMR** | 7 (68/1000) | 5 (64/1000) | NS |
| **Fresh Stillbirth** | 6 (64/1000) | 2 (25/1000) | NS |

LSCS = Lower Segment Caesarean Section; S = SIGNIFICANT, p value < 0.05; NS = not-significant, p > 0.05
NICU = Neonatal Intensive Care Unit PNMR = Perinatal Mortality Rate

**Table 4 :** Perinatal outcome in preterm twins in between 34 to 35.6 weeks according to the mode of delivery

| Newborn data | Vaginal delivery (44 sets) 88 newborns | LSCS ( 20 sets) 40 newborns | *p* value |
|---|---|---|---|
| **Birth Weight (gm)** (mean ± SD) | 1650 ± 268 | 1601 ± 304 | NS |
| **Apgar score** At 5 minutes | 7.6 ± 1.6 | 7.4 ± 2.1 | NS |
| **NICU Required** | 10 (11.4%) | 12 (30%) | **S** |
| **Foetal growth Restriction** | 38 (43.2%) | 20 (50%) | NS |
| **Sepsis** | 4 (4.5%) | 5 (12.5%) | NS |
| **PNMR** | 3 (35/1000) | 2 (52/1000) | NS |

LSCS = Lower Segment Caesarean Section; S = SIGNIFICANT, p value < 0.05; NS = not-significant, p > 0.05
NICU = Neonatal Intensive Care Unit PNMR = Perinatal Mortality Rate

**Table 5 :** Perinatal outcome in twins among elective deliveries according to the Gestational age.

| Newborn data | Elective : early 34 – 37 wks 6 days ( 22 sets) 44 newborns | Elective : late > 38 weeks ( 9 sets) 18 newborns | *p* value |
|---|---|---|---|
| **Birth Weight (gm)** (mean ± SD) | 1756 ± 353 | 2169 ± 314 | **S** |
| **Apgar score** At 5 minutes | 8.1 ± 2.0 | 9.44 ± 0.98 | **S** |
| **NICU Required** | 4 (9.09%) | 0 | NS |
| **Foetal growth restriction** | 21 (47.7%) | 8 (44.4%) | NS |
| **Sepsis** | 3 (6.8%) | 0 | NS |
| **PNMR** | 3 ( 69 per 1000) | 0 | NS |

S = SIGNIFICANT, p value < 0.05; NS = not-significant, p > 0.05
NICU = Neonatal Intensive Care Unit PNMR = Perinatal Mortality Rate

emergency LSCS (Em. LSCS), 31 sets (16.15%) were delivered by elective LSCS (El. LSCS). Among the total twin sets delivered by LSCS, 59.7% were delivered by emergency LSCS and 40.3% by elective LSCS. In Table 1 significant differences were found in Apgar scores among vaginally delivered babies with those of delivered by elective LSCS ($p$ =0.0054). Requirement of NICU admission was highest among emergency LSCS group (15.2%) and lowest in elective LSCS group (6.5%), though it was not statistically significant ($p$ = 0.13, Fisher's Exact test). As most of the elective LSCS were done due to some maternal complications, perinatal mortality rate was found to be higher in the LSCS group. In Table 2 only requirement of NICU admission was significantly higher in preterm newborns delivered by LSCS. However, incidence of sepsis and Perinatal Mortality Rate (PNMR) were higher in LSCS group. In Table 3 the average Apgar score was higher in newborns delivered by LSCS at term. Requirement of NICU admission, incidence of sepsis and PNMR were lower in LSCS group. Rate of fresh stillbirth was lower in the LSCS group. Table 4 summarized the data of perinatal outcome according to the mode of delivery in preterm twins delivered in between 34 to 35 weeks 6 days of gestational age. No significant difference was found in the parameters except higher requirement of NICU admission (30% vs. 11.4%) in LSCS group. However, incidence of sepsis was higher in the LSCS group. Among the elective LSCS group 22 sets were delivered in between 34 to 36 weeks 6 days of gestation and only 9 sets were delivered after 37 weeks of gestation. Table 5 summarized the data and the perinatal outcome of newborns delivered by Elective LSCS before 37 weeks and after 37 weeks of gestation. Significant differences were found in birth weights and Apgar scores at 5 minutes after birth. Though among early and late groups differences in the requirement of NICU admission (9.09% Vs 0.0%), incidence of sepsis (6.8% Vs 0.0%) and perinatal mortality (69/1000 Vs 0/1000) were found, they were not statistically significant.

## DISCUSSION

In our study we compared the perinatal outcome of twins delivered according to the mode of delivery. In Table 1 only statistically significant improvement was seen in average Apgar scores in between vaginally delivered newborns and those delivered by elective LSCS ($p$ = 0.005). Requirement of NICU admission was lowest in elective LSCS group but that was statistically insignificant. As we included twin pregnancies with at least 34 weeks of gestation, our study reaffirmed the evidence from previous studies that the mode of delivery was not associated with severe adverse neonatal outcome among twins whose birth weight was greater than 1000 gm [8] [9]. Ironically we found higher rate of perinatal mortality (49/1000 vs. 45/1000) and more incidence of sepsis in elective LSCS group (4.8% vs. 3.5%) in Table 1. We found a different picture in our study because of mainly two reasons, (i) In our institution elective LSCS is done in cases of twin pregnancies only if there is some other indication like post Caesarean section pregnancy, pregnancy in elderly primigravida with history of infertility, presentation of first twin as breech or mother with foetal growth restriction. oligohydramnios, Preeclamptic toxaemia (PET) etc. So there was not a single case of truly elective LSCS. These high-risk neonates might have inflated the mortality in the LSCS groups and only 31 (16.15%) cases were delivered by elective LSCS which was too small to be statistically significant. (ii) Among the 31 cases of elective LSCS, 15 cases (48%) were with growth discordance and 4 cases (13%) were highly discordant. So their perinatal outcome was poor.

If we consider perinatal outcomes of preterm twins (i.e. <37 weeks of gestation) according to the modes of delivery in Table 2, we found only significant higher rate of NICU admissions in newborns delivered by LSCS group (20.3% vs.9.6%). But incidence of sepsis and PNMR were insignificantly higher in the LSCS group. This was probably due to other maternal complications and high risk factors which compelled us to do LSCS in those cases and those factors inflated the neonatal morbidity and mortalities.

In Table 3, when comparing the perinatal outcomes of term twins according to the mode of deliveries, we observed a higher average Apgar scores (8.6 vs. 8.1) in the LSCS group. Lower rates of NICU admission (3.6% vs. 7.4%), sepsis (1.3% vs. 2.1%) and PNMR (64/1000 vs. 68/1000) were seen in the LSCS group. Smith et al in their retrospective cohort study of 8073 twin births reported that planned caesarean section may reduce the risk of perinatal death of twins at term by approximately 75% compared with attempting vaginal birth. This was principally due to reducing the risk of death of the second twin due to intrapartum anoxia [10]. Table 3 showed PNMR was insignificantly higher in vaginally delivered term twins than that of in LSCS group (68/1000 vs. 64/1000) and that was due to increase in the number of fresh stillbirth (64/1000 vs. 25/1000) which was consistent with the conclusion of Smith et al [11].

When the perinatal outcome of preterm twins in between 34 to 35 weeks 6 days of gestation was considered in the Table 4, we found only significant higher rate in requirement of NICU admission among newborns delivered by LSCS (30% vs. 11.4%). The average Apgar scores were slightly lower in LSCS group. Incidence of sepsis (12.5% vs. 4.5%) and perinatal mortality (52/1000 vs. 35/1000) were higher in the LSCS group. These were due to complications like PET, antepartum haemorrhage, oligohydramnios which needed LSCS and resulted with poor perinatal outcome. Though we got only 31 cases of elective LSCS, if we compare the perinatal outcomes in between newborns delivered electively at less than 37 weeks and at more than 37 weeks of gestations in Table 5, significant increase in birth weight (2169gm vs.1756 gm) and average Apgar scores (8.1 vs. 9.4) were found. There were insignificant lower rates of requirement of NICU admission, sepsis and perinatal mortality. Only 31 cases (16.15%) were too small to draw a conclusion.

Limitations: Many patients did not have comment on chorionicity in their ultrasonography reports. So we could not study the correlation of monochorionicity with other factors. We could not get the actual perinatal mortality rate as we have excluded the intrauterine foetal deaths as per our study criteria. Secondly we could not follow all the neonates who were discharged earlier than seven days after birth. We did not get a single case of LSCS which was done for the second twin where the first twin was born vaginally.

## CONCLUSION

In summary when we considered perinatal outcomes in preterm twins according to the mode of delivery, we found worse outcome in abdominally delivered newborns. But in term twins we found insignificant better outcome in newborns delivered by LSCS. While comparing the perinatal outcome according to the mode of delivery as a whole, we did not find significant difference except for the Apgar scores, in favour of elective LSCS. Thus we may conclude that in absence of significant maternal

complication, it is better to deliver twins at 37 completed weeks of gestation or later, may be preferably by elective LSCS, to avoid neonatal complications. Our findings reinforce the importance of future study on electively delivered late preterm and term twins in such developing countries.

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