

The Planned Mode of Delivery and Neonatal Outcomes of Uncomplicated Dichorionic Twin pregnancies

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Abstract

Background: The incidence of twins worldwide continues to increase. The intrapartum management of twins is a major area of risk in obstetrics, and the optimal mode of delivery is a subject of continuing debate, this can affect the physician counseling, and maternal requests for elective cesarean delivery. Planned cesarean delivery could theoretically avoid some of the risks but direct evidence of a protective effect is currently lacking. Moreover, cesarean delivery before the onset of labor is associated with an increased risk of neonatal respiratory morbidity.

Objectives: Is to compare the neonatal outcomes in planned vaginal and planned cesarean delivery of uncomplicated dichorionic twin pregnancies at 37-38 weeks.

Methods: This study was conducted at tertiary-care, Security Forces Hospital, Kingdom Saudi Arabia, about mode of delivery and neonatal outcome of 500 patients with uncomplicated dichorionic twin pregnancies at 37-38 weeks, during the period from November 2005 to October 2010.

Results: Out of 500 included in this study, only 202 patients were completed the study. 108 (53.4%) patients were in the planned vaginal delivery group, and 94 (46.6%) were in the planned cesarean group. In the planned vaginal delivery group, 23 (21.3%) had an emergency cesarean delivery. The overall cesarean rate was 117 out of 202 (57.9%). There was no significant difference in a 5-minute Apgar score lower than 7, an arterial cord pH below 7.20, and admission to NICU of the neonates between both groups.

Conclusion: Planned vaginal and planned cesarean delivery of uncomplicated dichorionic twin pregnancies at 37-38 weeks has the same neonatal outcomes.

Keywords: The planned mode of delivery; Neonatal outcomes; Uncomplicated dichorionic twin pregnancies

Introduction

The incidence of twins worldwide continues to increase [1]. The intrapartum management of twins is a major area of risk in obstetrics. Due to lack of consensus, the optimal mode of delivery in twin pregnancies is a subject of continuing debate [2]. This can affect the physician counseling, and maternal requests for elective cesarean delivery. The cesarean section rate for twins is 61.6% [3], approximately 60% in UK practice [4], and 67% in United States in 2003 [5]. Planned cesarean delivery could theoretically avoid some of the risks but direct evidence of a protective effect is currently lacking. Moreover, cesarean delivery before the onset of labor is associated with an increased risk of neonatal respiratory morbidity [6].

The aim of this study is to compare the neonatal outcomes in planned vaginal and planned cesarean delivery of uncomplicated dichorionic twin pregnancies at 37-38 weeks in tertiary care center.

Materials and Methods

This is prospective study conducted at tertiary-care, Security Forces Hospital (SFH), Kingdom Saudi Arabia, about mode of delivery and neonatal outcome of 500 dichorionic twin pregnancies during the period from November 2005 to October 2010. We included patients with uncomplicated dichorionic twin pregnancies delivered at 37-38 weeks, The Scientific and Ethics Committee at SFH, approved the research. All patients had antenatal care and delivered at SFH. In all patients labor and deliveries were managed by registrar and consultant Obstetricians. Gestational age and chorionicity were confirmed by first or early second trimester ultrasound in all cases. All patients in this study had anomaly scan at 20-22 weeks routinely and ultrasound every

3-4 weeks for growth, or more frequently if fetal growth restriction is suspected. Weekly biophysical profile was performed routinely from 34 weeks, or earlier if indicated.

Exclusion criteria includes, monochorionic, and monoamniotic twins, dichorionic twins delivered before 37 weeks, previous uterine scar, nonvertex second twin with an estimated fetal weight less than 1,500 gm, any pregnancies with absolute contraindication of vaginal delivery (first twin is in transverse lie, placenta previa), and any patient delivered outside our hospital.

At the clinic, we counseled all patients who can possibly deliver vaginally (vaginal delivery is not contraindicated if the first twin is in cephalic or in breech presentation and no absolute indication for cesarean section), and discuss with them in detail the risk and benefits of vaginal delivery versus cesarean delivery. The patient can choose whether she would like to attempt a vaginal delivery (group A) or to have cesarean section (group B) regardless the presentation of the first and second twin. The planned vaginal delivery group had defined as all patients for whom a vaginal twin delivery was planned between 37-38

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Received July 17, 2013; **Accepted** August 12, 2013; **Published** August 16, 2013

Citation: Khalil MI, Sagr ER, Elrifaei RM, AL-Mandeeel HM, AL-Hussein K (2013) The Planned Mode of Delivery and Neonatal Outcomes of Uncomplicated Dichorionic Twin pregnancies. Gynecol Obstet 3: 161. doi:10.4172/2161-0932.1000161

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weeks even if she came in labor at that gestation. The planned cesarean group had defined as all patients who chose to have a cesarean delivery between 37-38 weeks in spite of vaginal delivery can be performed.

Planned vaginal twin births are managed according to the protocol at SFH. An 18-gauge intravenous catheter was inserted with Ringer lactate solution, at 125 mL/h. Epidural anesthesia was offered for all patients who had attempted vaginal delivery, and spinal for cesarean section group. All patients whom attempted vaginal delivery had continuous electronic fetal heart monitoring for both twins during the first and second stage of labor, the first twin monitored by fetal scalp electrode and the second by an external transducer. Fetal blood sampling can be used to further assess any suspicious fetal heart tracing of the first twin. If the fetal heart tracing of the second twin becomes abnormal during the first stage of labor, delivery should be expedited by caesarean section. The indications to use syntocin are the same as with singletons. When the cervix is fully dilated, the patient moved to the operating room for delivery, with two obstetricians, pediatric teams, and an anesthesiologist. Everything is prepared for possible emergency cesarean. Operative delivery of first twin and cesarean delivery in labor are performed for the usual obstetric indications. Episiotomy is performed if clinically needed.

After vaginal delivery of the first twin, the cord is clamped and cut. The presentation of second twin is confirmed by physical examination, and if necessary by ultrasound. If the lie is longitudinal and the presentation is cephalic, one should wait until the head descends into the pelvis and perform an amniotomy during a contraction and fetal scalp electrode is applied to the vertex to ensure a good quality fetal heart recording. Once the head is engaged, the patient is instructed to push. Syntocin is used as appropriate. Operative delivery of second twin is performed for the usual indications. If the second twin is cephalic and unengaged and need urgent delivery, internal version is performed with breech extraction with the fetal spine up. Oxytocin needs to be discontinued during the extraction procedure.

If the second twin remains transverse and the fetal back dependant, and the fetal parts is difficult to feel vaginally, an External Cephalic Version (ECV) is the maneuver of choice for delivery. However, if the

fetal back lying towards the uterine fundus, with the feet dependent, internal version, amniotomy with complete breech extraction is the maneuver of choice for delivery in our unit. The technique described by Rabinovici and associates [7]. If the second twin is breech, one can await a spontaneous assisted breech delivery. Breech extraction can be done in emergency situation. After delivery of both twins, the third stage should be managed actively.

Apgar scores are assigned by the pediatric team. Arterial cord blood gas had been collected in all cases. The outcomes were the final mode of delivery in both groups and the effect of the mode of delivery on Apgar score at 1 minute, and 5 minute as well as the neonatal arterial cord pH for each twin.

The χ^2 , Fisher exact test, and Student *t* test were used when appropriate (SPSS for Windows 16.0, SPSS Inc.Chicago, IL).

Results

Out of 500 included in this study, only 202 patients were completed the study, 108 (53.4%) patients were in the planned vaginal delivery group, and 94 (46.6%) Patients were in the planned cesarean group. There was no difference in age, parity, chorionicity, gestational ages at delivery, and the mean birth weight of the fetuses between both groups (Tables 1 and 2). Epidural anesthesia was accepted and done in 100 cases (92.6%) of planned vaginal delivery group.

Out of the 108 patients in the planned vaginal delivery group, 85 (78.7%) had a vaginal delivery of both twins, 20 patients (18.5%) had an emergency cesarean delivery before delivery of the first twin, and 3 (2.8%) had an emergency cesarean delivery after ECV of second twin (after delivery of the first twin vaginally). The overall cesarean rate of both groups was 57.9% (117 out of 202). Indications for cesarean delivery in the planned vaginal group were arrest of labor in the first stage (6 patients), arrest in the second stage (4 patients), and nonreassuring fetal heart tracing (10 patients). The presentation of the second twin changed in 13 (14.7%) out of 88 patients after the vaginal delivery of the first twin.

After delivery of the first twin, ECV had been done for 7 cases for transverse lie of second twin. Out of these 7, four cases (57%) had fetal

	Planned vaginal delivery=Group A N=108	Planned cesarean delivery=Group B N=94	P value
†Maternal age	(31) 17-49	(32) 18-49	0.856
†Parity	(3) 0-10	(4) 0-11	0.792
‡No previous delivery	17 (14.65%)	15 (13.39%)	0.784
†Gestational age at delivery	(37w+2d) 37-38+0	(37w+3d) 37-38+0	0.986

† (Median) and range; ‡Number and (percentage); w=weeks; d=days; none had previous cesarean delivery

Table 1: Patients characteristics.

	Planned vaginal delivery N=108	Planned cesarean delivery N=94	P value
§Birth weight in g, first twin	2562 ± 329.7	2529 ± 341.6	0.99
§Birth weight in g, second twin	2497 ± 316.6	2418 ± 352.8	0.98
‡1 min Apgar score <7, first twin	2 (1.85%)	4 (4.25%)	0.233
‡1 min Apgar score <7, second twin	8 (7.4%)	3 (3.1%)	0.041*
‡5 min Apgar score <7, first twin	1 (0.92%)	0	0.895
‡5 min Apgar score <7, second twin	2(1.85%)	2 (2.1%)	0.97
‡Arterial cord pH <7.2, first twin	1 (0.92%)	1 (1.06%)	0.987
‡ Arterial cord pH <7.2, second twin	2 (1.85%)	2 (2.1%)	0.97
‡NICU admission	2 (1.85%)	2 (2.1%)	0.97
Duration of NICU admission (days)	2	2	1

‡ Number and (percentage); § Mean + standard deviation, g=gram; *statistically significant
There was no hypoxic ischemic encephalopathy or trauma for any of the first or the second twin in both groups

Table 2: Outcomes in both groups.

distress, out of these 4; three had emergency cesarean section, (two for prolonged fetal bradycardia, and one for cord prolapse).

Out of the 85 patients who delivered both twins vaginally, eight (9.4%) had a vacuum operative delivery of first twin, and two (2.3%) had a vacuum delivery of second twin. Internal podalic version with breech extraction of second twin had been done in 9 cases; five (5.8%) for transverse lie, four (4.7%) for unengaged cephalic second twin whom needed urgent delivery. Five (5.8%) had breech extraction for fetal distress, or failure to decent of breech. There was neither perinatal mortality nor major morbidity in all 14/85 (16.47%) fetuses after breech extraction.

In the planned vaginal delivery group, the patients who had a successful vaginal delivery were more likely to be younger (30 years compared with 37 years, $P=0.001$) and were more likely to have a prior vaginal delivery $P=0.005$.

The rates of 5-minute Apgar scores less than 7, and arterial cord pH values less than 7.20 were not significantly different in the planned cesarean group and the planned vaginal delivery group. 4 neonates (2 from each group) were admitted to NICU, and all discharged between 1-2 days. There was neither perinatal mortality nor major morbidity (Tables 2 and 3).

Discussion

In this study there was no significant difference in neonatal mortality or morbidity when comparing planned vaginal delivery versus planned cesarean section of uncomplicated dichorionic twin pregnancies at 37-38 weeks in tertiary care center. This is similar and in agreement with other studies [3,8]. In the planned vaginal delivery group, 78.7% achieved vaginal delivery of both twins, and 21.3% had an emergency cesarean delivery, this is similar to result of Fox et al. [3] as vaginal delivery was achieved in 84.6% with no significant difference in neonatal mortality or morbidity [3]. The overall cesarean rate in our study was 57.9%. This is similar to 61.6% (177 out of 287) in Fox et al. [3], approximately 60% in UK practice [4], and 67% in United States in 2003 [5]. This high rate of cesarean delivery may reflect some obstetricians' anxieties about vaginal twin delivery and may be seen as defensive practice. There was neither perinatal mortality nor major morbidity in the all fetuses who had breech extraction for the second twin in Group A, which is comparable with the findings of others [3,8]. We found that the risks of both fetal distress (57% versus 0%), and emergency cesarean section (42% versus 0%) were dramatically higher among ECV group than internal podalic version with breech extraction group. This is similar to others who found that the risks of both fetal distress (18% versus 1%) and emergency cesarean section (38% versus 3%) were dramatically higher among the ECV group than internal podalic version with breech extraction group [9]. The presentation of the second twin may change after delivery of the first in up to 20% of cases depending on the gestation [10]. In our study, the presentation

of second twin changed in 14.7% after the vaginal delivery of first twin. A Scottish study using linked databases of pregnancy and perinatal mortality demonstrated an excess of delivery-related perinatal death among second twins born at term [11]. The absolute risk of death of the second twin at term was 1 in 270 (or 3.7 per 1000 deliveries, 95% confidence interval 1.7-7.0) [11]. This is lower than estimated from observational data on singleton vaginal breech births (8.3 per 1000) [12], but higher than the equivalent risks of singletons in attempted vaginal birth after previous cesarean (1.3 per 1000) [13].

In some cases, (Combined twin delivery) cesarean section is required to deliver the second twin following vaginal delivery of the first. This used to be seen as a failure of obstetric management and reflected badly on the obstetrician who resorted to it. However, the practice occurred in 2.8% in our study, 3.5% of twin births in the UK [4], 4.3% in a Canadian study [14], 0.5% in study of Schmitz et al. [8], 0% in Fox et al. [3], and 17% in Alexander et al. [15], so it is, therefore, widespread. While any cesarean section at full dilatation carries risks for the mother (which may be increased in twin delivery), emergency cesarean section may be the preferred option if the alternative is an internal maneuver by an inexperienced operator.

Multiple issues may place a limitation on this study. One factor is the gestation is limited to 37-38 weeks, and it is very difficult to categorize the patients according to their risk factors for delivery of twins with this small number of patients. It is uncertain whether our results can be applied to all similar cases of twins of other population. One must keep in mind that the management and delivery of twins is highly operator-dependant. Moreover, given the same information about risks, different women will make different decisions about the right choice for them. On the basis of the Scottish study [11], it has been estimated that an RCT would require 6500 pregnancies to determine whether cesarean section would reduce the risk of perinatal death [11]. Therefore, as the first twin is in a breech presentation in about 20% of twins [9], and finally twins only represent approximately 1.2% of all births, it is unrealistic to expect an adequately powered trial could be performed among them.

Other factors contributing to favorable outcomes would include: all twins are term, and the application of the best techniques for delivery of twins (internal podalic version with breech extraction, ECV, instrumental delivery, and breech extraction) when indicated as mentioned in the methods of this study.

We concluded that, planned vaginal delivery of uncomplicated dichorionic diamniotic twin pregnancies at 37-38 weeks pregnancies seems to be associated with neonatal outcomes similar to those with planned cesarean delivery. It is crucial that women are provided with the best estimates of absolute risk of both the advantages and disadvantages of vaginal delivery and cesarean section, in order to make an informed choice between planned cesarean section and attempting vaginal birth.

Final mode of delivery	Vaginal delivery group (No. 108)		P value
	Vaginal delivery N=85	Emergency cesarean section N=23	
Number of patient			
‡ 1 min Apgar score <7, first twin	1 (0.92%)	1 (0.92%)	1
‡ 1 min Apgar score <7, second twin	6 (5.55%)	2 (1.85%)	0.042
‡5 min Apgar score <7, first twin	1 (0.92%)	0	0.346
‡ 5 min Apgar score <7, second twin	1 (0.92%)	1 (0.92%)	1
‡ Arterial cord pH <7.2, first twin	0	1 (0.86%)	0.318
‡ Arterial cord pH <7.2, second twin	1 (0.92%)	1 (0.92%)	1

‡ Number and (percentage); † statistically significant

Table 3: Outcome of the planned vaginal delivery group.

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