

Should all term twin pregnancies be delivered by caesarean section?

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Introduction

The subject of mode of delivery of twin pregnancies has been the topic of several journal publications. This debate was rekindled in a recent editorial where the question was raised whether all twins should be delivered by caesarean section.¹ Most of this debate concerned the neonatal outcome of the second born twin. The second twin is at a greater risk of hypoxia because complications such as malpresentation, the longer second stage, cord prolapse and abruptio placentae are more likely to occur at delivery of the second twin.² This has prompted several countries and academic centres to examine their data on neonatal outcome and mode of delivery in twin gestations.

Evidence for routine elective caesarean section

The adverse effect of vaginal delivery on the second twin was first raised in a population-based study of more than one million term births in Sweden.³ The Swedish Medical Birth Registry is one of the most complete birth registers in the world and it contains data on 98-99% of births in Sweden. Thorngren-Jerneck et al used data from the register for babies born between 1988-1997 to examine the obstetric risk factors for low 5 minute Apgar scores. In this study the greatest risk factors for an infant born with a 5-minute apgar score below 7 were vaginal breech delivery (OR 6.7), birth weights above 5kg (OR 6.3) and second born twins (OR 4.1).

Smith et al subsequently retrospectively evaluated data from The Scottish Morbidity Record and perinatal death records from England, North Ireland and Wales to determine the risk of perinatal death among twins born at term in relation to mode of delivery.^{4,5} The Scottish register is subject to regular quality assurance tests and has been more than 99% complete since the 1970s. Eight-thousand and seventy three twin pairs were examined in the Scottish study. The odds ratio for death after vaginal delivery of the second twin due to intrapartum anoxia was 21 (95% CI 3.4-868.5). This risk was

similar for twins delivered following induction of labour and sex discordant twins. Ninety percent of the deaths occurred among twins where the first was in cephalic presentation. However there was insufficient data to reliably determine whether the second twin was in a cephalic or non-cephalic presentation. There was no risk of death of the second twin if delivery was by planned caesarean section. Twenty-seven percent of women not delivered by planned caesarean section were delivered by emergency caesarean section. The authors concluded that planned caesarean section might reduce the risk of intrapartum anoxia of the second twin and thus reduce the risk of perinatal death of twins at term by 75% compared with vaginal birth.

The England, Northern Ireland and Wales study examined 1 377 twin pregnancies between 1994-2003. There was no association between mode of delivery and perinatal death amongst preterm twins. There was a statistically significant risk of death for the second twin born at term (OR 2.3; 95% CI 1.7-3.2). There was a trend ($p=0.1$) towards a greater risk of the second twin dying of anoxia after vaginal delivery (OR 4.1, 95%CI 1.8-9.5) compared with those delivered by caesarean section (OR 1.8, 95%CI 0.9-3.6). Therefore this study concluded that at term the second twin is at 2-fold increased risk of perinatal death and almost 4-fold risk of death caused by intrapartum anoxia if delivered vaginally compared with caesarean section.

The above data is supported by a population-based study of more than 8 000 vertex-vertex twin births in the United States between 1995-1997. The odds ratio for non-congenital anomaly related death of a second twin (> 2 500g) who was delivered vaginally was 2.72 (95% CI 1.09-8.24).⁶ The rate of emergency caesarean section after vaginal delivery of the first twin was 6%. The odds ratio for death of the second twin in this group was 30.29 (95% CI 11.22-95.31).

Evidence against routine caesarean section

In Sweden today, if the first twin is in a cephalic presentation, the vaginal route is the preferred mode of delivery in uncomplicated twin pregnancies. When the first twin is in a breech presentation, caesarean section is recommended.² This difference in policy for uncomplicated twin pregnancies

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was examined from data obtained from the Swedish Medical Birth Registry for twins born between 1980 and 2004. Therefore 2 groups of twin pairs were selected for this study. Group A consisted of twin pairs with the first twin in a breech presentation, delivered by caesarean section while in Group B the leading twin was in a cephalic presentation and these infants were delivered vaginally. In this study of uncomplicated twin pregnancies there was no difference in neonatal mortality between the 2 groups after 34 weeks gestation (OR 0.42; 95% CI 0.10-1.79). However there was a statistically significant reduction in neonatal mortality before 34 weeks if delivery was by caesarean section. These results are consistent with a report from the United States of twin deliveries between 1995-1997.⁷

Other studies have looked at modifying factors that may play a role in neonatal morbidity and mortality. A study in the United States examined the effect of birth weight discordance and mode of delivery on neonatal mortality rates.⁸ This study analysed 340 446 twins born after 32 weeks. Babies diagnosed with congenital malformations or chromosomal abnormalities were excluded. Caesarean section had no effect on neonatal mortality if the birth weight discordance was less than 40%. Beyond 40% birth weight discordance, vaginally delivered twins had a 1.6 times increased neonatal mortality rate compared with those delivered by caesarean section. In another study there was 6.5 times increased risk of fetal death and 2.5 times increased risk of perinatal death in twins with discordance of 25%.⁹

Two recent studies evaluated the effect of twin-to-twin delivery time interval on neonatal outcome.^{10,11} A population based study in Germany evaluated more than 4000 twin deliveries after 34 weeks gestation between 1990 and 2004.¹⁰ There was no association between delivery interval and perinatal death, however a delivery interval of more than 15 minutes was associated with adverse short-term outcome for the second twin. The mean twin-to-twin delivery time interval was 13.5 minutes. A delivery interval of more than 15 minutes was associated with a birth weight of the second twin at least 20% greater than that of the first twin and abnormal presentation of the second twin such as breech and transverse lie. Intrapartum factors such as fetal distress after delivery of the first twin, assisted vaginal delivery, caesarean section in labour, abruption and cord prolapse was also associated with a longer time interval. There was an association between twin-to-twin delivery interval and acidosis (umbilical artery pH < 7.1) and this relationship was also seen in deliveries with concordant fetal weight and the second twin in a cephalic lie. The odds ratio for acidosis when the delivery interval was 0-15 minutes was 1; when the delivery interval was 16-30 minutes, OR 3.5 (95% CI 2-6.3), 31-45 minutes 5.2 (2.4-11.5), 46-60 min 6.7 (2.5-17.7), >60 min 9.3 (3.6-23.8). The protective effect of a short inter-twin delivery interval was shown in a French study where active management of the second twin was performed routinely.¹¹ The mean inter-twin delivery interval was 4.9+/- 3.2 minutes and in uncomplicated twin pregnancies, there was no difference in composite neonatal morbidity for the second twin between planned caesarean and planned vaginal delivery.

Finally, a systematic review of one randomised trial and three cohort studies did not show a statistically significant

difference in perinatal or neonatal mortality for twins delivered after planned caesarean compared to planned vaginal delivery. There was a greater risk of neonatal respiratory problems in the planned caesarean group.¹²

Points to consider in decision making

The beneficial effects of a routine caesarean section for the neonate must be balanced against any potential increase in risk to the mother. In a clinical scenario where the first twin is vertex and the second is in a non-vertex position (many clinicians would offer vaginal birth of both twins) 1 222 caesarean sections would have to be performed to prevent 1 neonatal death and 25 caesarean deliveries are needed to avert 1 major morbidity or mortality event.¹³ If vaginal delivery is attempted, between 6-9% of second twins will be born by emergency caesarean section after vaginal delivery of the first twin.^{6,14} Clinicians in favour of planned caesarean sections argue that maternal mortality is 70% higher if caesarean delivery is performed intrapartum rather than as a planned procedure.¹⁵ The improved safety of caesarean sections is largely due to the use of regional anaesthesia, prophylactic antibiotics, thromboprophylaxis, improved suture material and techniques for controlling haemorrhage. This argument was strengthened when a working group for the National Institutes of Health in the United States found no evidence that elective caesarean section increased the risk to a healthy mother having her first delivery compared with vaginal birth.¹⁶ However the long-term risks associated with caesarean delivery must also be considered. During the next pregnancy the patient is increased risk of placenta praevia, placenta accreta, emergency caesarean section and preterm birth. The number of caesarean section that are needed to harm is 3 for every additional emergency caesarean delivery, 355 for one additional preterm birth and 1 536 for one additional placenta accreta.¹⁷ Therefore a caesarean section during the next pregnancy will expose the mother to even greater risks of morbidity.

Conclusion

Counselling a mother with an uncomplicated twin pregnancy is complex because the optimal mode of delivery is unclear. Most of the data on maternal and neonatal outcome come from population-based studies and factors such as chorionicity are not addressed in these studies. We hope that better data will be provided by the Twin Birth Study, an ongoing trial of 2 400 twin pregnancies randomly assigned to deliver vaginally or by caesarean section.

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