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Mode of delivery of twins

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Perinatal mortality is five times higher in twins than in singletons. This increased risk is mainly owing to factors unrelated to mode of delivery. 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. It is plausible that planned caesarean section may have a protective effect on these outcomes but there is a lack of direct evidence in this area. This review outlines some issues to raise when counselling and planning twin birth at term.

Introduction

It has long been recognised that the delivery of twins constitutes an area of significant risk in obstetrics. Perinatal mortality is five times higher in twins than in singletons.¹ This is mostly because of factors unrelated to mode of delivery, such as antepartum stillbirth, the effects of prematurity and congenital abnormality. The attempted vaginal birth of twins is, however, recognised as an area associated with specific risks.² Determining the possible protective role of interventions, in particular the use of caesarean section, necessitates isolating and measuring adequately the effects of mode of delivery. Already in UK practice, approximately 60% of twins are delivered by caesarean section.³ This high rate may reflect some obstetricians' anxieties about vaginal twin delivery and may be seen as defensive practice. Similar issues surrounded the question of vaginal breech birth of singletons and initial observational studies that suggested a protective effect of caesarean delivery were vigorously criticised.⁴ Although some controversy remains, the breech argument was largely resolved by a large-scale randomised controlled trial (RCT) which confirmed a protective effect of planned caesarean delivery on perinatal mortality and morbidity.⁵ The argument surrounding vaginal birth of twins still relies solely on observational data for adequately powered studies. This review describes the methods by which existing evidence should be interpreted and identifies from the existing evidence such conclusions as can be drawn.

support a given statement. The precise wording of these statements varies, but a similar hierarchy is described from RCTs at the highest level, through other controlled trials, comparative observational studies, descriptive observational studies to the consensus of expert opinion in the absence of quantitative evidence at the bottom. The major advantage of RCTs over other sources of comparative data is that differences between groups are unlikely to be explained by a number of types of bias; specifically, selection bias and, if blinded, observer bias. RCTs are not, however, completely free from bias, particularly if the quality of the trial is suboptimal; for example, in terms of allocation, blinding or attrition.⁶

A major problem related to RCTs in obstetrics is that serious adverse outcomes are relatively uncommon. For example, delivery-related perinatal death of the second twin at term affects approximately one in 270 births.⁷ On the basis of this, it has been estimated that an RCT would require 6500 twin pregnancies to determine whether caesarean section would reduce the risk of perinatal death.⁷ Although RCTs have been conducted,² these include a small fraction of the number required to test the hypothesis and such studies will, almost inevitably, yield negative results. The proposal that Bayesian statistical methods might be employed to overcome issues of statistical power⁸ is undermined by the fact that the prior probability – each clinician's personal belief – is highly variable. Moreover, the extent to which the prior probability and its confidence interval are modified by a given trial still depends on the size of the trial.

Any reviewer approaching this question who dismisses observational data will, therefore, conclude that there is no evidence to support the use of caesarean section. This form of statement

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Levels of evidence

Virtually all surveys of medical literature relating to interventions now present some form of assessment of the 'level' of the evidence used to

is potentially misleading, as it is easy to equate the absence of evidence (the lack of any appropriate study) with evidence of absence (convincing data that the given intervention is ineffective).⁹ These theoretical issues present obstetricians with practical problems when making clinical decisions. While it is true to say that there are no data from RCTs directly addressing the question in twins, there is evidence to indicate that caesarean section is likely to reduce perinatal mortality and morbidity in this context (see below). All evidence includes uncertainty, which can take many forms. The problem with characterising 'levels' of evidence based on one source of uncertainty (that is, study design) is that it encourages simplistic examination of highly complex questions.

Antenatal care and timing of delivery

There are several features of the antenatal management of twin pregnancies that are important when considering mode of delivery in twins. Accurate gestational dating is best performed in the first-trimester of pregnancy;¹⁰ clearly, this is important for optimal planning of timing of delivery. First-trimester ultrasound has the most accurate diagnosis of chorionicity and amnionicity, with close to 100% sensitivity and specificity.¹¹ Current practice is to deliver monoamniotic twins by planned caesarean section because of the increased risk of cord complications.² Some centres advocate earlier delivery of all monochorionic twins. There are two main reasons for this. First, antepartum stillbirth is particularly common among twins and the risk may increase with advancing gestational age. If intrauterine death of one of a pair of monochorionic twins occurs, there is a high risk of death (around 25%) or serious morbidity of the other twin (around 50%).¹² Second, monochorionic twins are at risk of twin-to-twin transfusion syndrome; early elective delivery eliminates the risk of late adverse events due to late-onset twin-to-twin transfusion syndrome. Clearly, these potential benefits of early elective delivery need to be balanced against the risks of prematurity. The exact gestational age where the balance is achieved is unclear, although some centres schedule delivery as early as 36 weeks.

Twins are at increased risk of fetal anomaly and, subject to parental consent, all twin pregnancies should undergo a detailed anatomical survey. Antenatal biometry is typically performed every 4 weeks for dichorionic twins and every 2 weeks for monochorionic twins.¹³ Twins are known to have an increased risk of growth restriction. The relevance for this in the context of mode of

delivery is that, in the presence of fetal compromise, planned caesarean section may be performed to avoid the stress of labour. Also, increased birthweight discordance between twins is associated with an increased risk of delivery-related perinatal death.⁷

Some studies have indicated a marked excess of stillbirths among twins at around 38 weeks, describing a greater than fivefold excess over singletons.¹⁴ However, these analyses ignore key differences in the management of intrauterine fetal death. If a singleton dies *in utero*, labour will usually be induced promptly. If one of a dichorionic twin pair dies *in utero*, the pregnancy will typically be managed conservatively until 37–38 weeks, when labour will be induced. It follows, therefore, that there will be an apparent marked excess of antepartum stillbirths among twins at around this gestation. Nevertheless, when expressed as all deaths at or beyond 24 weeks, there is a three-fold excess of antepartum stillbirth among twins.¹⁵ Given the much higher risk of antepartum stillbirth among twins, elective delivery before 40 weeks would seem to be a reasonable approach.

Mode of delivery

First twin breech

Most reviews of twin pregnancy recommend that, where the first twin is presenting by the breech, delivery should be by planned caesarean section.² A large-scale RCT has demonstrated that planned caesarean section reduced the risk of neonatal morbidity or mortality among singleton pregnancies in a breech presentation.⁵ It took many years for this trial to be undertaken in singletons. Given that the first twin is in a breech presentation in about 20% of twins¹⁶ and that twin births represent approximately 1.2% of all births, it is unrealistic to expect that an adequately powered trial would be performed among twins.

There are no compelling biological reasons to suggest that breech delivery would be safer for the first twin than for a singleton. Indeed, two factors would influence the decision. First, successful breech delivery depends upon flexion of the neck. It is conceivable that the presence of the second twin may adversely affect flexion in the first. Second, if the second twin is in a cephalic presentation, there is the possibility of the heads locking as the body of the first is delivered. The incidence of this is estimated at one in 88 breech-cephalic twins and it results in perinatal death in 30%.¹⁷

First twin cephalic

For some years, UK practice has generally been that vaginal delivery will normally be considered when the first twin is in a cephalic presentation. There is some controversy when the second twin is in a noncephalic presentation. However, the presentation of the second twin may change after delivery of the first, in up to 20% of cases, depending on the gestation.¹⁷ Therefore, if non-cephalic presentation of the second twin is seen as a contradiction to attempting vaginal birth, then either both twins should be delivered by planned caesarean or emergency caesarean section should be performed for the second twin in the event that the presentation becomes non-cephalic after delivery of the first.

Most current reviews suggest that vaginal delivery should be attempted if the first twin is cephalic, irrespective of the lie and presentation of the second, provided that the estimated fetal weight is greater than 2000 g.² There are, however, a number of lines of evidence that suggest that this policy may be associated with a specific increased risk of morbidity and mortality in the second twin. A study of 16 000 twin pairs in New York between 1978 and 1984¹⁸ demonstrated rates of intrapartum stillbirth and neonatal death three to four times greater than the rest of the population. Twins delivered vaginally had a four-fold risk of neonatal mortality compared with those delivered by caesarean section. However, the analysis described births that happened at least 20 years ago. Moreover, the analysis lacked details as to whether caesarean sections were planned or emergency, on the cause of death and on the birth order of the twins. A Swedish analysis of approximately one million births at term between 1988 and 1997 demonstrated a four-fold risk of a depressed 5-minute Apgar score among second twins.¹⁹ 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.⁷ Among 2436 twin births at or after 36 weeks of gestation by a means other than planned caesarean section, there were no deaths among first twins and nine deaths among second twins ($P=0.007$). Seven of the nine second-twin births were caused by intrapartum anoxia, including five from an obstetric mechanical cause, such as cord prolapse or birth trauma. Six of these followed cephalic vaginal delivery of the first twin. The absolute risk of death of the second twin at term was one in 270 (or 3.7 per 1000 deliveries, 95% confidence interval 1.7–7.0). This is lower than estimated from observational data on singleton vaginal breech births (8.3 per 1000)⁴ but higher than the equiv-

alent risks of singletons in attempted vaginal birth after previous caesarean (1.3 per 1000).²⁰

The Scottish study showed no first- or second-twin deaths among 454 planned caesarean sections but the numbers were too small to differ significantly. In addition, the potential neonatal morbidity of twin delivery by planned caesarean section at term was not recorded. A meta-analysis of observational studies of caesarean delivery has shown reduced risk of a depressed 5-minute Apgar associated with planned caesarean delivery when the first twin is presenting by the breech but found no significant difference when the first twin was cephalic.²¹ However, the meta-analysis included far fewer than the 6500 twin pairs which have been estimated to be required for an appropriately powered comparison.

The current data suggest that with current obstetric practice there is an excess risk of perinatal morbidity and mortality among second twins born at term. The majority of the deaths were due to intrapartum anoxia and followed cephalic vaginal birth of the first twin. Unfortunately the data are insufficiently detailed to determine whether the risk varies according to the presentation of the second twin prior to the onset of labour. There is an inherent difficulty with data obtained from registries, in that detailed information about events during labour and delivery, such as the presentation of the second twin and any manoeuvres attempted to deliver it, may not be recorded. However, the low frequency of adverse events such as perinatal death means that it is difficult to obtain data from other sources, such as RCTs, with sufficient events as to be meaningful. So, on the basis of the information currently available, planned caesarean section may, therefore, reduce the risk of perinatal death even when the first twin is in a cephalic presentation. However, there are no adequately powered studies at present that have addressed this. Women should be informed of the small risk of perinatal death to the second twin (of around 1 in 270), the potential benefits of planned caesarean delivery and offered the choice between planned caesarean section and attempting vaginal birth. It is important to remember that, given the same information about risks, different women will make different decisions about the right choice for them. The key example of this is screening for Down syndrome. Different women will attach different degrees of importance to the consequences of their decisions. However, it is crucial that women are provided with the best estimates of absolute risk of both the advantages and disadvantages of intervention, in order to make an informed choice.

Attempting vaginal birth

A detailed discussion of this topic is beyond the scope of this review and only selected issues are discussed here. All twin births should be conducted in a hospital with facilities for immediate caesarean section because of the risk of intrapartum fetal hypoxia and the necessity for immediate caesarean delivery. There is an absence of RCT evidence regarding the use of electronic fetal monitoring (EFM) in twin births. However, it is universally recommended by all reviewers. Routine use of EFM has been criticised in singleton births because of a lack of evidence of benefit. In fact, the meta-analysis of RCTs demonstrates a significant reduction in neonatal seizures even in low-risk pregnancies. The apparent absence of an effect of EFM on either perinatal mortality or cerebral palsy does not inform this question. The meta-analysis is underpowered to address either of these outcomes.⁹

Most authors recommend epidural anaesthesia for women attempting vaginal birth for twins. It may facilitate manoeuvres to deliver the nonvertex second twin and can also be used to provide immediate anaesthesia for intrapartum caesarean section. The drawback of the invasiveness of an epidural needs to be set against the risks of maternal morbidity and mortality associated with general anaesthesia. In practice, many obstetricians prefer to deliver twins in theatre, with ultrasound immediately available. This reflects the possibility that, in some cases, caesarean 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 3.5% of twin births in the UK³ and 4.3% in a Canadian study,²² so it is, therefore, widespread. While any caesarean section at full dilatation carries risks for the mother (which may be increased in twin delivery),²³ emergency caesarean section may be the preferred option if the alternative is an internal manoeuvre by an inexperienced operator.

Delivery of the noncephalic second twin

Some authors have suggested that external cephalic version (ECV) should be attempted when the second twin presents by the breech, following vaginal delivery of the first. However, a series of studies comparing ECV with breech extraction found that the risks of both emer-

gency caesarean section (38% versus 3%) and fetal distress (18% versus 1%) were dramatically higher among the ECV group.¹⁶ One of the interesting and rather ignored technical issues of assessment of evidence that arises from these studies is the question of external validity. Analysis of 'levels of evidence' primarily addresses the internal validity of studies, defined as the "extent to which systematic error (bias) is minimised in clinical trials".⁶ External validity is defined as the "extent to which results of trials provide a correct basis for generalisation to other circumstances".⁶ In this context, it may be that the operator performing either ECV or breech extraction in a research trial has skills that are much more highly developed than the operator in a given obstetric unit or the average practitioner in a given country. It does not follow, therefore, that because a research series presents a low rate of complications for such a procedure this can safely be extrapolated to other populations. The other key issue in the interpretation of these studies is that they are, invariably, underpowered to address the question of whether these manoeuvres affect the risk of perinatal death.

Time interval between twin births

The standard dictum was that the second twin should ideally be delivered less than 15 minutes after the first and invariably within 30 minutes. However, these recommendations preceded the availability of EFM. Nevertheless, one study has shown that, even when continuous EFM is employed, the risk of acidosis in the second twin increases with increasing interval between births. This finding supports the view that when the interval exceeds 30 minutes delivery should probably be expedited.²⁴

Conclusions

The intrapartum management of twins is a major area of risk in obstetrics and twins are at increased risk of delivery-related death. Planned caesarean delivery could theoretically avoid some of these risks but direct evidence of a protective effect is currently lacking. The possible effects of caesarean section on short- and long-term maternal morbidity and future pregnancies should also be considered. Counselling of women should involve a frank discussion of the uncertainties and the small absolute risk of adverse events at term. ■

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