Should all Twins be Delivered by Caesarean Section? A Preliminary Report

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The aim was to analyse the neonatal mortality related to mode of delivery for twins using a population-based registry. In all, 18,125 twins delivered in Sweden between 1991 and 1997, after excluding those with unknown gestational duration, were used to analyse the differences between groups of twins. Results showed the OR for neonatal death, breech vaginal delivery versus caesarean section (all indications) was 1.47 (95% CI 0.99-2.17). The OR at vaginal delivery for neonatal death, twin I in breech versus cephalic presentation was 5.60 (2.62-11.94) and for twin II the corresponding figures were 1.85 (1.03-3.32). Analyses using population-based registries from other countries are needed to confirm or reject the present findings of an increased neonatal mortality for twins in breech presentation delivered vaginally.

Twins have a perinatal mortality and morbidity 4–6 times higher than singletons (Powers & Wampler, 1996). Known risk factors associated with this grim prognosis are monochorionicity and the increased incidence of preterm birth. Other determinants of prognosis include time interval between the births, birthweight discordance, maternal weight, gain or lack thereof, and level of delivery unit. However, in the debate that presently exists among professionals, the most important single factor of risk seems to be mode of delivery.

Previous Swedish population based studies relating prognosis for twins to mode of delivery have specifically dealt with twins with a birthweight < 2,500 g (Rydhström, Ingemarsson & Ohrlander, 1990), twins with a birthweight < 1,500 g (Rydhström, 1990), twins with a birthweight discordance > 1.0 kg (Rydhström, 1993), and twins with a birthweight 1,500–2,500 g (Rydhström & Ingemarsson, 1991). End points have included fetal death, early neonatal death, perinatal death, neonatal death, as well as morbidity including cerebral palsy. In none of these investigations has it been possible to identify mode of delivery as a factor significantly altering the prognosis. In all previous studies information on birthweight was used as the independent variable. In retrospect it may be said that birthweight probably is a less than optimal approximation for gestational duration (Stanley, Blair & Alberman, 2000).

To perform population based studies in obstetrics, especially using relatively rare outcomes as end points, large national registries are needed. Such registries are emerging around the world, but in many instances still lack valid data on gestational duration. To further complicate matters it is not possible to separately analyse twin I and twin II in some registries, and valid data on mortality later in life is not easy or possible to find in most registries.

The aim of this study is to analyse neonatal mortality related to mode of delivery using gestational duration, rather than birthweight, as the independent variable.

Material and Method

Information regarding perinatal mortality and duration of pregnancy for all women included in the present study was collected from the Medical Birth Registry (MBR) at the National Board of Health and Welfare, Stockholm. The MBR stores prenatal, perinatal and postnatal data on virtually all singleton and twin pregnancies, including gestational duration. The validity of MBR data has previously been verified in a 0.5% random sample of deliveries from 1974 and 1986, and a new sample is presently under investigation (unpublished information). In the MBR, gestational duration represents the best estimate based on information regarding last menstrual period, expected date of delivery, corrected expected date of delivery (from ultrasound) and the maternity unit's estimate of gestational duration. The last menstrual period was used as the basis for determining gestational duration only when information was missing, or the clinical examination was performed late in the first trimester. As a rule, an emergency caesarean section was defined as an operation with less than 8 hours between decision and delivery, whereas elective caesarean section more than 8 hours passed between decision and delivery. Neonatal mortality was defined as death after and up to 28 days following birth. Information on mortality is continuously cross-checked with vital statistics using the unique personal identification number given to each individual shortly after her/his birth in Sweden.

The present analysis comprises 18,125 twins delivered in Sweden between 1991 and 1997, after excluding those with unknown gestational duration. Odds ratio (OR) was used to estimate the differences between groups of twins. The 95% confidence intervals were calculated according to the method advocated by Miettinen (1974).

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Results

In all, 18,125 twins were born between 1991 and 1997. Of these, 186 twins (1.04%) died in the early neonatal period and another 54 (0.3%) in the following three weeks. The OR for neonatal death, breech vaginal delivery versus caesarean section (all indications) was 1.47 (95% CI 0.99–2.17). For twins below 32 weeks gestation the corresponding OR was 2.50 (1.58–3.99), for 32–36 weeks 0.40 (0.13–1.24) and for > 37 weeks 0.48 (0.13– 1.71). Excluding all twins delivered with elective caesarean section the corresponding figures were 2.05 (1.31–3.22), 1.42 (0.55–3.65) and 3.74 (1.14–12.21), respectively.

The OR at vaginal delivery for neonatal death, twin I in breech versus cephalic presentation was 5.60 (2.62-11.94) and for twin II the corresponding figures were 1.85 (1.03–3.32). Analysing the total material and stratifying for gestational duration into < 32 weeks, 32-36 weeks and > 37 weeks the corresponding figures were 2.91 (1.73–4.90), 1.26 (0.34–4.65), and 2.29 (0.51–10.33), respectively.

Discussion

The results of this study seem to indicate that the twin in breech presentation delivered vaginally experiences a worse prognosis than the twin delivered abdominally. A similar significantly worse prognosis for the twin in breech presentation was seen when a comparison was made with twin delivered vaginally in cephalic presentation.

Unfortunately, no direct comparison is possible with previous studies from Sweden. The reason is that two decades ago ultrasound screening was not a routine. Accordingly, the information on gestational duration was considered less suitable than birthweight when stratification into mature and premature twins had to be performed. It is obvious that stratification for birthweight most probably confounds the analysis on perinatal or neonatal mortality when small-, appropriate-, and large-for-gestational age twins are lumped into the same birthweight stratum (Stanley et al., 2000).

Few population-based studies in recent years have addressed the hypothesis that twins delivered by caesarean section experience lower perinatal/neonatal mortality than vaginally delivered twins. The reason for this lack of studies is illustrated by the present study. Although the analysis is based on average on about 100,000 deliveries and about 2,600 twin births each year, the confidence intervals become extremely broad when subanalyses are performed. This indicates that even using this relatively large population based material (comprising all twins delivered in about 55 hospitals during seven years) the numbers are too small to allow any definite conclusions. This fact indicates that a truly randomised controlled study with a sufficient number of twins will never be performed, despite all pleas for "evidence". The present figures also indicate that hospital based studies on these issues are meaningless, because of small numbers of twins in each unit.

A recent article in The Lancet discusses reliable assessment of the effects of treatment in observational studies (MacMahon & Collins, 2001). Several confounders may be present in the present study. It is probable that a selection bias to caesarean delivery was present, not only based on medical indications but also, for example, based on ethnicity, maternal and paternal education and several other difficult or impossible to identify factors in retrospect. A meta-analysis of several population based studies might merely compound these biases, that is, produce more precise, but still biased, estimates of the effects of treatment (MacMahon & Collins, 2001).

The most important confounding factor in the present study may be gestational duration that not only influences neonatal mortality but also the rate of caesarean section. Moreover, the indication for caesarean section *per se* influences perinatal mortality. For example, twins delivered abdominally because of placental abruption have a higher perinatal mortality than those delivered vaginally. Figure 1 shows the situation for singleton delivery in Sweden between 1973 and 1995 (2.2 million deliveries, all indications). For the above reasons abdominal delivery confers a higher perinatal mortality than vaginal delivery (Socialstyrelsen, 1999). In contrast to these results, the present study shows a higher neonatal mortality for vaginal births when a crude stratification for gestational duration is performed. This finding indicates that the neonatal mortality for breech twins delivered vaginally may be even worse.

In a discussion on the interpretation of results from observational studies, the size of the effect of treatment is important. In case a large OR is seen, this argues for a real effect. Where moderate effects are seen, observational studies have little role in the direct assessment of effects (MacMahon & Collins, 2001). For breech vaginal versus cephalic vaginal delivery an OR of 5.6 was seen. This relatively large OR indicates a "true" effect. However, the wide confidence interval, from 2.62 to 11.94, leaves the reader with much uncertainty.

A recent well-performed study on singletons term breech delivery indicates that the preferred mode of delivery should be a caesarean section to reduce perinatal mortality and serious morbidity (Hannah et al., 2000). For singleton breech preterm delivery, few population-

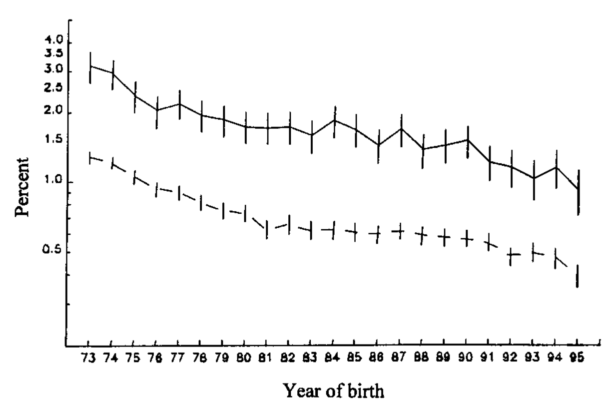

Figure 1

Perinatal mortality in Sweden between 1973 and 1995. Broken line shows all singleton delivery, solid line singleton abdominal delivery. Mean and 95% confidence interval. Log scale (Socialstyrelsen, 1999).

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based studies exist and no truly randomised study with a sufficient number of patients has ever been performed.

The clinician is left to make her/his own conclusions based on the figures from this and previous population based studies. The pregnant woman with twins should be advised to deliver in a unit with a genuine interest and competence in vaginal twin delivery. This needs either be the largest hospital in the area, or a tertiary unit. The patient needs full information about the risks with vaginal and abdominal delivery. Of those who had a caesarean section in their first pregnancy, over 50% in Sweden will deliver abdominally in the second. Of the 200 women delivered with caesarean section in their first pregnancy, 1–2 will have a uterine rupture in their second vaginal delivery, with a substantial mortality and morbidity for the infant. Hypothetically, the day we decide to deliver *all* twin pregnant women in Sweden abdominally, 1 woman will die every 5–10 years because of complications related to the operation *per se.* It is of paramount importance for the obstetrician to understand that the pregnant woman is willing to take (almost) *any* risk to have a healthy infant, whereas the obstetrician in her/his calculations also has to include all the risks for the mother with an abdominal delivery.

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