PRETERM SINGLETON BREECH DELIVERY IN A TEACHING HOSPITAL OF SAUDI ARABIA: VAGINAL VERSUS CESAREAN DELIVERY

Turki G. Gasim, SBOG, ABOG
Department of Obstetrics and Gynecology, King Fahd Hospital of the University, Al-Khobar, Saudi Arabia

Objectives: The aim of this study was to determine the incidence of singleton preterm breech babies born in a teaching hospital, and to study the influence of the mode of delivery on perinatal outcome in preterm births with breech presentation.

Methods: A retrospective analysis from the medical records of patients who had preterm singleton breech delivery (24 – 36 weeks gestation) was undertaken in a tertiary care hospital in the Eastern province of Saudi Arabia between January 1992 and December 2001. All the patients with intrauterine fetal death, multiple pregnancies and lethal congenital fetal malformations were excluded from the study. Intrapartum and neonatal morbidity and mortality in vaginal versus cesarean delivery groups were the main outcomes measured.

Results: Of 24,708 deliveries that occurred in the hospital during the period of study, there were 195 preterm singleton breech deliveries, giving an incidence of 0.08%. One hundred and forty-eight (75.9%) patients delivered vaginally and did not have any medical or obstetric complications. Forty-seven (24.1%) patients underwent caesarean section. While the neonatal morbidity was similar in the two groups, the neonatal mortality was significantly higher for vaginal delivery than cesarean section (p<0.00069).

Conclusion: In view of the significantly higher neonatal mortality found in vaginal delivery, the present study favors abdominal delivery for a singleton preterm breech fetus.

Key Words: Breech presentation, premature breech delivery, caesarean section for preterm breech, neonatal mortality.

J Fam Community Med 2008; 15(2):65-70.

Correspondence to:
Dr. Turki G. Gasim, Department of Obstetrics and Gynecology, King Fahd Hospital of the University, P.O. Box 40300, Al-Khobar 31952, Saudi Arabia
E-mail: tgasim@yahoo.com
INTRODUCTION
Breech presentation occurs in 3-4% of all deliveries. The occurrence of breech delivery decreases with advancing gestational age from 25% of births before 28 weeks gestation to 16% of births at 32 weeks, and 1-3% of births at term. Predisposing factors for breech presentation include prematurity, uterine abnormalities (e.g., malformations, fibroids, polyhydramnios, placenta previa), fetal abnormalities (e.g., CNS malformations, neck masses, aneuploidy), and multiple gestations. Fetal abnormalities are observed in 17% of preterm breech deliveries compared with 9% of deliveries at term.

Perinatal mortality is increased 2 to 4 fold with breech presentation, regardless of the mode of delivery. Fetal malformations, prematurity, and intrauterine fetal death being the common causes of increased perinatal mortality.

The usual complications associated with vaginal preterm delivery are entrapment of a relatively large after coming head, cord prolapse, in-coordinate labor, intrapartum hypoxia, aspiration pneumonia and traumatic injuries.

With the increase in the safety of caesarean sections, and the recent advances in neonatal care, obstetricians all over the world find themselves in a dilemma regarding the management of the preterm breech in labor. Following the study by Hannah et al, many obstetricians have come to view preterm breech delivery as a high-risk situation, dealt with by primary caesarean section.

There is a wide range of views on this, so the literature consists of conflicting reports. On the one hand Mattern et al reported no increase in perinatal morbidity and mortality in preterm breech babies delivered vaginally; whereas Demol et al found that cesarean section had a protective effect on neonatal mortality rates.

This contradiction between results reported in the literature prompted us to evaluate the outcomes of delivery in singleton preterm breech fetuses in our institution and assess the advantage, if any, of cesarean section over vaginal delivery. This was possible because breech presentation does not necessarily indicate an abdominal delivery to all physicians in our hospital.

MATERIAL AND METHODS
A retrospective analysis of the medical records was carried out on the patients who had singleton preterm breech deliveries (between 24 and 36 weeks gestation) at King Fahd Hospital of the University, Al-Khobar in the Eastern province of Saudi Arabia between 1st January 1992 to 31st December 2001. All the breech presentations with intrauterine fetal death, multiple pregnancies and lethal congenital fetal malformation were excluded from the study. Betamethasone, 12 mg intramuscular injection, every 24 hours for two doses had been administered to the mother when indicated. The use of epidural analgesia had been encouraged as appropriate. All the vaginal breech deliveries had been conducted or supervised by an experienced obstetrician. All the newborns were examined by a neonatologist for birth defects, Apgar scores and evidence of birth trauma immediately after delivery.

The babies born were divided into six categories according to their gestational age and birth weight.

Statistical analyses were performed using the Fisher's exact test and the chi-square test where appropriate. The differences were considered statistically significant when \( p< 0.05 \).

RESULTS
Of 24,708 deliveries during the period of study, there were 195 preterm singleton breech deliveries, giving an incidence of 0.8%. The overall incidence of breech deliveries in the hospital was 3.3% (815 cases). Table 1 shows the distribution of the 195 preterm breech babies born, according to gestational age and birth weight, represented in six categories. The number of deliveries that occurred between 26 and 33+6 weeks gestation equaled the total number delivered between 34 to 36 weeks.

| Gestational age (weeks) | Birth weight (g) | Total No. (%) |
|------------------------|------------------|---------------|
| 24-25+6                | 500-699          | 34 (17.4)     |
| 26-27+6                | 700-999          | 22 (11.3)     |
| 28-29+6                | 1000-1249        | 14 (7.2)      |
| 30-31+6                | 1250-1499        | 18 (9.2)      |
| 32-33+6                | 1500-1999        | 27 (13.9)     |
| 34-36+6                | >2000            | 80 (41.0)     |

Total 195 (100)

The mode of delivery of the patients is shown in Table 2. Altogether, 148 (75.9%) patients delivered vaginally and 47 (24.1%) patients underwent caesarean section.
### Table 2: Mode of delivery of the 195 preterm singleton breech infants

| Gestational age (weeks) | No. of infants | Vaginal n (%) | Cesarean section n (%) |
|-------------------------|----------------|---------------|------------------------|
| 24-25+6                | 34             | 32            | 2                      |
| 26-27+6                | 22             | 18            | 4                      |
| 28-29+6                | 17             | 10            | 7                      |
| 30-31+6                | 15             | 6             | 9                      |
| 32-33+6                | 27             | 13            | 14                     |
| 34-36+6                | 80             | 69            | 11                     |
| **Total**              | **195**        | **148 (75.9)**| **47 (24.1)**          |

### Table 3: Indications for cesarean section performed in 47 patients with singleton preterm breech presentation

| Indications                        | Gestational age in weeks | Total (%) |
|------------------------------------|--------------------------|-----------|
| Total                              | 24-25+6                  | 26-27+6   |
| Associated feto-maternal conditions| 28-29+6                  | 30-31+6   |
| Pregnancy induced hypertension     | 32-33+6                  | 34-36+6   |
| Antepartum hemorrhage              | 24 (68.1)                | 32 (68.1) |
| Cord prolapse                      | 4 (27.7)                 | 7 (27.7)  |
| Fetal distress                     | 2 (28.6)                 | 2 (28.6)  |
| Cervical dystocia                  | 1 (11.1)                 | 1 (11.1)  |
| Previous cesarean section          | 1 (18.2)                 | 1 (18.2)  |
| Breech Alone                       | 32 (68.1)                | 32 (68.1) |

### Table 4: Mode of delivery and 5-minute Apgar scores of the preterm singleton breech babies

| Gestational age in weeks | Mode of delivery (n) | 1-2 n (%) | 4-6 n (%) | >6 n (%) |
|--------------------------|----------------------|-----------|-----------|---------|
|                          | Vaginal (32)         | 8 (25.0)  | 16 (50.0) | 8 (25.0) |
|                          | CES (2)              | 1 (50.0)  | 1 (50.0)  |         |
| 24-25+6                  | LSCS (18)            | 5 (27.7)  | 4 (22.2)  | 9 (50.0) |
|                          | LSCS (4)             | 1 (25.0)  | 2 (50.0)  | 1 (25.0) |
| 26-27+6                  | Vaginal (10)         | 4 (40.0)  | 3 (30.0)  | 3 (30.0) |
|                          | LSCS (7)             | 2 (28.6)  | 3 (42.9)  | 2 (42.9) |
| 28-29+6                  | Vaginal (6)          | 3 (50.0)  | 1 (16.6)  | 2 (33.3) |
|                          | LSCS (9)             | 1 (11.1)  | 4 (44.4)  | 4 (44.4) |
| 30-31+6                  | Vaginal (13)         | 2 (15.4)  | 4 (30.8)  | 7 (53.8) |
|                          | LSCS (14)            | 1 (7.1)   | 3 (16.6)  | 10 (71.4) |
| 32-33+6                  | Vaginal (69)         | 4 (5.8)   | 4 (5.8)   | 61 (88.4) |
|                          | LSCS (11)            | 2 (18.2)  | 1 (9.1)   | 8 (72.7)  |

LSCS=Lower segment cesarean section

### Table 5: Neonatal complications and outcome of the preterm singleton breech infants

| Neonatal outcome                        | Vaginal group (n=148) | Cesarean section (n=47) | p-value |
|-----------------------------------------|-----------------------|-------------------------|---------|
| Admission to Neonatal Intensive Care Unit | 106 (71.6)           | 34 (72.3)               | -       |
| Sepsis                                  | 32 (21.6)            | 13 (27.7)               | -       |
| Jaundice                                | 17 (11.5)            | 10 (21.3)               | -       |
| Birth asphyxia                          | 5 (3.4)              | 2 (4.3)                 | -       |
| Hyaeline membrane disease               | 42 (28.4)            | 18 (38.3)               | -       |
| Pulmonary hemorrhage                    | 12 (8.1)             | 0 (0)                   | -       |
| Intraventricular hemorrhage             | 7 (4.7)              | 2 (4.3)                 | -       |
| Head entrapment                         | 3 (2.0)              | 0 (0)                   | -       |
| Neonatal death                          | 57 (38.5)            | 5 (10.6)                | 0.00069 |

Preterm Singleton Breech Delivery 67
incidence of caesarean section was higher in the patients between 30 – 33+6 weeks of gestation compared with vaginal delivery, while vaginal delivery was more common in the immature breeches (24 - 25+6 weeks) and babies which were of higher gestational age (34 – 36 weeks).

The indications for caesarean section were divided into two categories as shown in Table 3. Those with a feto-maternal risk factor besides the breech presentation (32 cases-68.1%), and those with no high risk factor other than breech presentation (15 cases-31.9%).

In the group below 28 weeks gestation, 5 (15.6%) caesarean sections were performed mainly for feto-maternal indications compared with 21 (65.6%) procedures between 28-33+6 weeks. In the last group between 34-36 weeks, 33.3% of patients underwent caesarean section for breech presentation alone, which was nearly double the incidence (18.8%) for feto-maternal indications.

Inter-group differences in early neonatal outcome, as measured by Apgar score, were not significant and are shown in Table 4. The incidence of low Apgar scores was much higher in the very low birth weight group (24 – 27+6 weeks) delivered vaginally.

Table 5 shows the complications of the neonates in the 2 groups. There were 57 (38.5%) neonatal deaths in the vaginal group, compared with 5 (10.6 %) in the caesarean group, which was statistically significant (p< 0.0069).

DISCUSSION

The incidence of breech presentation is far more common among preterm fetuses than full term infants. The incidence of singleton preterm breech delivery in this study, which was 0.8%, comprised 23.9% of all breech deliveries in the hospital, and was similar to the incidence reported by Hill.

Preterm singleton breech delivery is a controversial subject, because there are no randomized studies regarding the mode of delivery of such fetuses. In spite of the lack of clear scientific evidence that mode of delivery of preterm breech presentation affects outcome, the cesarean section rate remains high, overall. In a meta-analysis of 6 such trials, the problem of recruiting participants was highlighted. Five trials had to be terminated before the calculated number of study participants had been recruited. The sixth, a prospective randomized study was performed on only 38 women with preterm labor (28-36 wk) and breech presentation. Of these women, 20 were randomized to attempted vaginal delivery and 18 to immediate cesarean delivery. Of the vaginal group, 25% of patients underwent cesarean delivery for non-reassuring fetal heart rate tracing. Five neonatal deaths occurred in the vaginal group, and one in the cesarean delivery group. Two infants died from fetal anomalies, 3 from respiratory distress, and one from sepsis. No non-anomalous infant who died was acidotic at delivery or had birth trauma. No significant differences in Apgar scores existed, although a trend toward lower Apgar scores existed in the vaginal group, similar to our study. The small number of subjects in Zlatnik's study (1993) precluded a definitive conclusion regarding the safer mode of delivery for the preterm breech fetus.

We would, therefore, have to depend upon retrospective data to determine our course of clinical action. Retrospective analyses showed higher mortality in vaginal breech infants weighing 750-1500 g (26-32 wk), and less certain advantage of cesarean delivery among fetuses weighing more 1500 g (approximately 32 wk). This small subgroup (26-32 wk) may benefit from cesarean delivery.

Breech presentation in labor is common in the early gestational age groups and associated with a higher incidence of cord prolapse, as evidenced in Table 3. Besides, severe hypertension necessitated abdominal delivery in the patients less than 34 weeks gestation in the study. Between 28 and 33+ weeks gestation, fetal distress and cervical dystocia were the main indications for cesarean section as the breech is an ineffectual cervical dilator. Footling breech was the main indication for abdominal delivery between 28 and 33+ weeks gestation (9/15 cases – 60.0%) and prolonged labor among 34 – 36 weeks gestation in the breech alone category.

Caesarean section is a major surgical procedure, and maternal morbidity is known to be higher after a caesarean delivery in comparison with vaginal birth. In addition, delivering women by caesarean section results in a significantly longer hospital stay. In this study, the average length of hospital stay of the patients with caesarean section was six days, while vaginally delivered patients were generally discharged after 24 hours. Furthermore, caesarean section has well
known consequences on future pregnancies, with a risk, albeit small, of uterine rupture during labor associated with potential maternal and fetal complications. This limits the number of subsequent deliveries in women who have had caesarean section. Large families are the norm of the Saudi society.

Fortunately, in spite of published observations of a high incidence of head entrapment in breech deliveries, three babies (2.0%) in the vaginal group and none in caesarean group had head entrapment in the study. It may well be that close supervision by the attending physicians and adherence to meticulous technique (analgesia, anesthesia, and maneuvers) contributed to the absence of this mechanical complication.

Interestingly, there were no significant statistical differences in the neonatal admission to the Neonatal Intensive Care Unit (NICU) between the two groups in this study. Both groups had almost the same admission rate (71.6% for babies delivered vaginally vs. 72.3% for the caesarean group) to the NICU. Premature babies suffer many complications (sepsis, jaundice, birth asphyxia, hyaline membrane disease, pulmonary hemorrhage, necrotizing enterocolitis and intraventricular hemorrhage). There was no significant difference of these complications between the two groups.

Statistically significant difference in the neonatal death rate between the cesarean and vaginal delivery groups was found. There were 57 (38.5%) neonatal deaths among the vaginally delivered babies compared with 5 (10.6%) among the babies delivered by cesarean section (p<0.0069). Forty-seven of the 57 babies that were delivered vaginally and died in the neonatal period were due to extreme prematurity. The mean gestational age at birth of those neonates was 26 weeks.

Traumatic morbidity specifically related to vaginal delivery in breech presentation, such as fractures and soft tissue trauma of the fetus was not a major problem. Whether delivering the breech abdominally or vaginally, physicians should be familiar with all the maneuvers that may be necessary for a successful delivery of this abnormal presentation.

In terms of outcome, Milasinovic et al, concluded that occurrence of cerebral dysfunction was inversely proportional to gestational age and body weight at birth. In other words, the mode of delivery does not significantly affect cerebral dysfunction, which means that intrapartum trauma is not a frequent cause of cerebral dysfunction of preterm newborns. Furthermore, vaginal delivery can be safely conducted for preterm breech if the course of labor is normal and cardiotocography findings are within physiologic values.

It must be emphasized that, a risk-benefit ratio should be carefully evaluated for each delivery method, based on the clinical facts of the individual case. The parents require detailed counseling that includes discussion of both the obstetric and neonatal implications by a senior staff member of each team.

It may be concluded from this study that abdominal delivery of the singleton preterm breech infant is preferred. Besides, caesarean section is considered the safer mode of delivery for fetuses between 26 – 32 weeks gestation (750-1500g). The higher neonatal mortality after vaginal delivery supports the policy of caesarean section as the safer mode of delivery for preterm breech fetuses between 26 and 32 weeks gestation. Our findings in the study conform with the above recommendation.

REFERENCES

1. Demol S, Bashiri A, Furman B, Maymon E, Shoham-Vardi I, Mazor M. Breech presentation is a risk factor for intrapartum and neonatal death in preterm delivery. Eur J Obstet Gynecol Reprod Biol 2000; 93(1): 47-51.
2. Hickok DE, Gordon DC, Milberg JA, Williams MA, Daling JR. The frequency of breech presentation by gestational age at birth: a large population-based study. Am J Obstet Gynecol 1992;166(3):851-2.
3. Albrechtsen S, Rasmussen S, Dalaker K, Ingens LM. Factors influencing delivery method in breech presentation. Acta Obstet Gynecol Scand 1998; 77:416.
4. Warke HS, Saraogi RM, Sanjanwalla SM. Should a preterm breech go for vaginal delivery or caesarean section. J Postgrad Med 1999; 45:1-4.
5. Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AR, et al. Planned cesarean section versus planned vaginal birth for breech presentation at term: a randomized multicentre trial. Term Breech Trial Collaborative Group. Lancet 2000; 356(9239):1375-83.
6. Mattern D, Straube B, Hagen H. Effect of mode of delivery on early morbidity and mortality of premature infants (< or = 34th week of pregnancy, [Article in German] Z Geburtshilfe Neonatol 1998; 202(1):19-24.
7. Hill LM. Prevalence of breech presentation by gestational age. AmJ Perinatol 1990; 7:92-3.
8. Schneider H. Gentle obstetrical management for very early preterm deliveries. [Article in German] Gynakol Geburtshilfliche Rundsch 2004; 44(1):10-8.
9. Zlatnik FJ. The Iowa premature breech trial. Am J Perinatol 1993;10(1):60-3.
10. Collea JV, Chein C, Quilligan EJ. The randomized management of term frank breech presentation. AmJ Obstet Gynecol 1990;137:235-44.
11. Eller D, VanDorsten J. Route of delivery for the breech presentation: A conundrum 1995;173:393-8.
12. Al Fadel S M, Al Suleiman SA, Al Awamy B, Kaul K K. Growing up in Qatif: Child health profile of Qatif region in Eastern Province, Saudi Arabia. EMHJ 1995;1(1):27-34.
13. Bodmer B, Benjamin A, McLan FH, Usher RH. Has use of cesarean section reduced the risks of delivery in the preterm breech presentation? Am J Obstet Gynacol 1986;154:244-50
14. Milasinovic L, Kapamadzija A, Petrovic D, Nikolic L. Incidence of cerebral dysfunction as a parameter for decision making in the management of preterm labor. Med Pregl 2000; 53(9-10):485-92.
15. Herbst A, Kallen K. Influence of mode of delivery on neonatal mortality and morbidity in spontaneous preterm breech delivery. Eur J Obstet Gynecol Reprod Biol 2007;113:25-9.