Incidence of Vaginal Breech Delivery in Singleton in Siriraj Hospital

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Objective: *To determine the incidence of vaginal breech delivery at Siriraj Hospital and to evaluate factor affecting mode of delivery.*
Design: *Cross-sectional study.*
Setting: *Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University.*
Subject: *A total of 317 women with singleton breech presentation, ≥ 28 weeks of gestation, who had their deliveries at Siriraj Hospital during January 1st to December 31st 2003.*
Material and Method: *The medical records of these women were reviewed to determine the incidence of vaginal breech delivery. Characteristics regarding current pregnancy and delivery and maternal and fetal outcomes were evaluated, including parity, gestational age, estimate fetal weight, cervical dilation, membranes status, maternal complications, types of breech presentation, and being a private case.*
Results: *The incidence of vaginal breech delivery among these women was 17.7%. Univariate analysis showed that multiparity, gestational age of ≤ 32 weeks, estimate fetal weight of ≤ 2500 grams, advanced cervical dilatation, ruptured membranes, and not being a private case increased the risk of vaginal breech delivery. Multiple logistic regression analysis demonstrated that only advanced cervical dilatation (4-7 cm, adjusted OR 10.7, 95%CI 3.5-33.0; > 7 cm adjusted OR 40.4, 95%CI 12.6-129.2), ruptured membranes (adjusted OR 2.9, 95%CI 1.3-6.3), multiparity (adjusted OR 6.4, 95%CI 2.6-15.7), and gestational age < 32 weeks (adjusted OR 9.7, 95%CI 2.7-35.7) were independently associated with vaginal breech delivery. However, lower apgar scores and neonatal complications, especially prematurity, were more frequent in vaginal than cesarean delivery.*
Conclusion: *Vaginal breech delivery was found in 17.7% of singleton breech presentation in Siriraj Hospital. Certain characteristics during labor and delivery were associated with mode of delivery including advanced cervical dilatation, ruptured membranes, multiparity, and preterm gestational age.*

Keywords: *Breech presentation, Incidence, Vaginal delivery*

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Approximately 3-4% of all pregnancies reach term with a fetus in the breech presentation. There is a general consensus that planned cesarean section might be better than vaginal birth for the delivery of the fetus in some conditions or if a clinician experienced in vaginal delivery is not available[1]. In some studies, vaginal breech delivery has been associated with higher fetal morbidity and mortality rate compared with elective cesarean delivery. However, although cesarean delivery may reduce the risk of adverse perinatal outcomes, it may increase maternal morbidity and cost of care[2,3]. A meta-analysis of infant outcomes after breech delivery showed a higher risk of fetal injury or death in selected term breech infants allowed a trial of labor than in those selectively delivered by cesarean[5]. However, the increasing of cesarean section rate in breech presentation has not been associated with differential improvement in neonatal outcomes when compared with the outcomes of those with cephalic presentation[4].

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An argument against routine cesarean delivery for breech presentation has been the concern about risk of maternal complications. Recently, an international multicenter randomized trial reported improved neonatal outcomes with elective cesarean section compared to vaginal delivery in breech presentation at term, without an increased risk of maternal complications[6]. A recent publication by ACOG recommended that the patients with persistent breech presentation at term in a singleton gestation should undergo a planned cesarean delivery but does not apply to patients presenting in advanced labor in whom delivery is likely to be imminent[7]. However, controversy exists regarding the most appropriate management of the term breech presentation.

In Siriraj Hospital, cesarean delivery among breech presentation is not routinely practiced and vaginal breech delivery is still performed. The main objective of the present study was to determine the incidence of vaginal breech delivery in Siriraj Hospital. In addition, factors associated with vaginal breech delivery as well as maternal and fetal complications were evaluated.

Material and Method

A retrospective study was conducted at Siriraj Hospital with the approval of the institutional ethic committee. A total of 325 women with singleton breech presentation at the time of delivery and more than 28 weeks of gestation who had their deliveries at Siriraj Hospital during 2003 were enrolled. Those 8 women who were indicated for elective cesarean delivery, including placenta previa, previous cesarean delivery and dead fetus in utero were excluded. So that the total of study population were 317 cases.

A review of medical records and labor records were conducted among these women. Data that were extracted included baseline characteristics, current and past obstetric history, maternal complications, characteristics of stages of labor, types of breech presentation, route of delivery, and maternal and neonatal outcomes. Incidence of vaginal breech delivery was estimated. Various characteristics were compared between different routes of delivery to determine associated factors for vaginal breech delivery. Maternal and neonatal outcomes were also compared between different routes of delivery as well.

Statistical analysis was performed using SPSS for Windows. Univariate analysis was used to compare various characteristics between different routes of delivery, using Student t-test and chi-square test as appropriate. Relative risks and their 95% confidence intervals were estimated. Multiple logistic regression analysis was used to determine independent factors associated with vaginal breech delivery. A p value of < 0.05 was considered statistical significance.

Results

During 2003, the total delivery in Siriraj Hospital were 11195 cases, total breech delivery in singleton and gestational age not less than 28 weeks were 325 cases (2.9%), but a total of 317 women with breech presentation at the time of delivery and met inclusion and exclusion criteria were recruited in the present study. Table 1 shows baseline characteristics of the women. Mean maternal age was 28.2 $\pm$ 6.3 years and mean gestational age was 37.5 $\pm$ 2.6 weeks. Majority of these women were primiparous (59.3%). Almost 25% of the fetus presented with footling breech. Fetal weight estimation fell between 2500-3000 g in 53% of the women and 30% were estimated

Table 1. Baseline characteristics of pregnant women in the present study

Characteristic	N (%)
Maternal age (year) mean $\pm$ SD	28.2$\pm$6.3
Gestational age (week) mean $\pm$ SD	37.5$\pm$2.6
$\geq$ 37 weeks	250 (78.9%)
33-36 weeks	49 (15.5%)
28-32 weeks	18 (5.7%)
Parity	
0	188 (59.3%)
1	98 (30.9%)
$\geq$ 2	31 (9.8%)
Type of breech presentation	
Footling breech	77 (25.0%)
Non-footling breech	240 (75.0%)
Estimate fetal weight (gram) mean $\pm$ SD	2841.9$\pm$519.6
> 3000 grams	95 (30.0%)
2500-3000 grams	168 (53.0%)
< 2500 grams	54 (17.0%)
Cervical dilatation (cm) mean $\pm$ SD	3.3$\pm$3.1
$\leq$ 3 cm	197 (62.1%)
4-7 cm	69 (21.8%)
$\geq$ 8 cm	51 (16.1%)
Membranes status	
Intact	218 (68.8%)
Ruptured	99 (31.2%)
Maternal medical complication	
No	286 (90.2%)
Yes	31 (9.8%)
Private case	
Yes	93 (29.3%)
No	224 (70.7%)

Table 2. Comparison of various characteristics between different routes of delivery

Characteristics	Vaginal route N (%)	Cesarean section N (%)	RR (95%CI)	p value
Maternal age (year) ± SD	26.4±5.7	28.6±6.1		0.014
Gestational age				<0.001
≥ 37 weeks	32 (12.8%)	218 (87.2%)	1.0	
33-36 weeks	13 (26.5%)	36 (73.5%)	2.1 (1.2-3.7)	
28-32 weeks	11 (61.1%)	7 (38.9%)	4.8 (2.9-7.8)	
Parity				<0.001
0	13 (6.9%)	175 (93.1%)	1.0	
1	31 (31.6%)	67 (68.4%)	4.6 (2.5-8.3)	
≥ 2	12 (38.7%)	19 (61.3%)	5.6 (2.8-11.1)	
Estimate fetal weight				<0.001
> 3000 grams	11 (11.6%)	84 (88.4%)	1.0	
2500-3000 grams	24 (14.3%)	144 (85.7%)	1.2 (0.6-2.4)	
< 2500 grams	21 (38.9%)	33 (61.1%)	3.4 (1.8-6.4)	
Cervical dilatation				<0.001
≤ 3 cm	5 (2.5%)	192 (97.5%)	1.0	
4-7 cm	19 (27.5%)	50 (72.5%)	10.8 (4.2-27.9)	
≥ 8 cm	32 (62.7%)	19 (37.3%)	24.8 (10.1-60.2)	
Membranes status				<0.001
Intact	23 (10.6%)	195 (89.4%)	1.0	
Ruptured	33 (33.3%)	66 (66.7%)	3.2 (2.0-5.1)	
Maternal complication				1.000
No	235 (82.2%)	51 (17.8%)	1.0	
Yes	26 (83.9%)	5 (16.1%)	1.0 (0.8-1.2)	
Type of breech presentation				0.131
Footling	18 (23.4%)	59 (76.6%)	1.0	
Non-footling	38 (15.8%)	202 (84.2%)	0.7 (0.4-1.1)	
Private case				<0.001
Yes	6 (6.3%)	87 (93.7%)	1.0	
No	50 (22.3%)	174 (77.7%)	3.5 (1.5-7.8)	

to be > 3000 g. On admission, 62.1% of the women had cervical dilatation of less than 4 cm, and only 16.1% had cervical dilatation of more than 8 cm. Intact membranes were found in 68.8%. Almost 30% of these women were private cases (29.3%).

Of these 317 women, 56 delivered vaginally. Therefore, the incidence of vaginal breech delivery in the present study was 17.7%.

Table 2 shows comparison of various characteristics between each mode of delivery. It was found that gestational age < 37 weeks, multiparity, estimated fetal weight of < 2500 g, cervical dilatation of > 3 cm, ruptured membranes, and not being a private case were significantly increased the risk of vaginal breech delivery in varying degree (all p-values were < 0.001). Relative risks and their 95% CI are shown in Table 2 and the strongest association was observed with cervical dilatation of > 3 cm.

Multiple logistic regression analysis was performed to determine independent associated factors for vaginal breech delivery and the results are shown in Table 3. The only significant factors were cervical dilatation, membranes status, parity, and gestational age. Adjusted OR for cervical dilatation of

Table 3. Factors independently associated with vaginal breech delivery from multiple logistic regression analysis

Characteristics	Adjusted OR	95%CI
Cervical dilatation		
≤ 3 cm	1.0	
4-7 cm	10.7	3.5-33.0
≥ 8 cm	40.4	12.6-129.2
Membranes status		
Intact	1.0	
Ruptured	2.9	1.3-6.3
Parity		
Nulliparity	1.0	
Multiparity	6.4	2.6-15.7
Gestational age		
≥ 32 weeks	1.0	
< 32 weeks	9.7	2.7-35.7

4-7 cm was 10.7 (95%CI 3.5-33.0), and for dilatation of ≥ 8 cm was 40.4 (95%CI 12.6-129.2). Ruptured membranes increased the risk 2.9 times (95%CI 1.3-6.3), multiparity increased the risk 6.4 times (95%CI 2.6-15.7), and gestational age of < 32 weeks increased the risk 9.7 times (95%CI 2.7-35.7).

Table 4 shows comparison of maternal and neonatal outcomes between each route of delivery. Apgar scores at 1 and 5 minutes of < 7 were significantly more common among those delivered vaginally compared to cesarean delivery (42.9% vs 16.5%, and 8.9% vs 2.3%, respectively, $p < 0.001$). In addition, others neonatal complications, including neonatal jaundice and prematurity, were significantly higher among those delivered vaginally as well (17.9% vs 14.2%, and 19.6% vs 2.3%, respectively, $p < 0.001$). However, maternal complications were comparable between the 2 groups.

Discussion

In the present study, the incidence of vaginal breech delivery was about 17.7%. The reported rates of vaginal breech delivery were different between studies. The retrospective population-based cohort study of 100,667 in breech presentation at the time of delivery in California showed that 4.9% of these women delivered vaginally[9]. Another report of 1,021 cases of singleton breech in Miami found 14.4% vaginal breech delivery rate[3]. The rate has been reported to be as high as 57.4% from a retrospective study of 1,050 term singleton breech in Sweden[6]. The differences might be due to the differences in patient's characteristics and conditions in each population and the differences in the experiences of their care teams.

The present study found that the possibility of vaginal breech delivery increased if the pregnant women were multiparous, had gestational age less than 32 weeks, were in active stage of labor (advanced cervical dilatation) and membranes ruptured. Some studies suggested that the criteria for selection of pregnant women for vaginal breech delivery included pelvic measurement, estimated fetal weight, and types of breech presentation[2,12]. Halmesmaki E also suggested that multiparous patients had the possibility of safe vaginal breech delivery with continuous fetal heart rate monitoring. However, it depended on the experience of obstetricians who should have the possibility of supporting such a choice by the patient[11].

The present study demonstrated that neonatal morbidities increased significantly among those delivered vaginally, including lower Apgar scores at 1 and 5 minutes, and majority of such morbidities were due to prematurity. In addition, these might be due to hypoxia and trauma during delivery as well. Similar results were also observed by others[1-3,5,6,9].

Previous report showed that the risk of cerebral palsy in relation to breech presentation at term was not related to the mode of delivery. On the contrary, the cerebral palsy linked to the higher rate of IUGR among breech infants[10]. Another study of 1,645

Table 4. Comparison of maternal and neonatal outcomes between different routes of delivery

Characteristics	Vaginal route N (%)	Cesarean section N (%)	p value
Puerperal morbidity			0.692
No	54 (96.4%)	253 (96.4%)	
Yes	2 (3.6%)	8 (3.1%)	
Birth weight (g) Mean ± SD	2538.8±640.5	2950.0±515.2	<0.001
Sex			1.000
Female	28 (50.0%)	128 (49.0%)	
Male	28 (50.0%)	133 (51.0%)	
Apgar score at 1st minute			<0.001
≥ 7	32 (57.1%)	218 (83.5%)	
< 7	24 (42.9%)	43 (16.5%)	
Apgar score at 5th minute			0.029
≥ 7	51 (91.1%)	255 (97.7%)	
< 7	5 (8.9%)	6 (2.3%)	
Other neonatal complications			<0.001
No	29 (51.8%)	172 (65.9%)	
Neonatal jaundice	10 (17.9%)	37 (14.2%)	
Prematurity	11 (19.6%)	6 (2.3%)	
Other	6 (10.7%)	46 (17.6%)	

infants with breech presentation at term also showed that there were no significant difference in long-term morbidity between elective cesarean section and planned vaginal delivery in terms of severe handicap or other outcomes[8]. In order to evaluate such effects of mode of delivery on long term outcomes of the infants with breech presentation, a large number of patients and a longer systematic follow up are required.

The best mode of delivery for breech presentation will remain controversial until there will be the large randomized trials with selected outcomes, such as long term infant and maternal morbidity are conducted. At present, vaginal breech delivery could be performed safely without increasing maternal and neonatal morbidities with the use of appropriate protocols for patient selection, continuous fetal monitoring, and presence of experienced obstetricians and neonatologists.

Conclusion

The incidence of vaginal breech delivery in Siriraj Hospital was 17.7%. The factors that associated with vaginal breech delivery included advanced cervical dilatation, ruptured membranes, multiparity, and preterm gestational age. However, neonatal morbidities increased among those delivered vaginally. Appropriate patient selection and care during labor and delivery might improve such adverse outcomes and infants with breech presentation might be safely delivered vaginally.

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อุบัติการณ์การคลอดทารกท่าก้นทางช่องคลอดในครรภ์เดี่ยวในโรงพยาบาลศิริราช

ธันยารัตน์ วงศ์วนานุรักษ์, ดิฐกานต์ บริบูรณ์หิรัญสาร

วัตถุประสงค์: *เพื่อศึกษาอุบัติการณ์การคลอดทารกท่าก้นทางช่องคลอด ในโรงพยาบาลศิริราชและศึกษาถึงปัจจัยที่มีผลต่อการคลอดดังกล่าว*

วิธีการศึกษา: *การศึกษาแบบตัดขวาง*

สถานที่ทำการศึกษา: *ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ศิริราชพยาบาล, มหาวิทยาลัยมหิดล*

กลุ่มตัวอย่าง: *หญิงตั้งครรภ์เดี่ยวและทารกอยู่ในท่าก้นจำนวน 317 คน ที่มีอายุครรภ์ไม่ต่ำกว่า 28 สัปดาห์ และมาคลอดที่โรงพยาบาลศิริราชตั้งแต่ช่วงเดือนมกราคมถึงธันวาคม พ.ศ. 2546*

การกระทำ: *ทำการทบทวนแฟ้มบันทึกประวัติผู้ป่วยกลุ่มตัวอย่าง เพื่อเก็บข้อมูลการคลอดและประมาณค่าอุบัติการณ์การคลอดทารกท่าก้นทางช่องคลอด ทำการเก็บข้อมูลปัจจัยต่าง ๆ ที่เกี่ยวข้องกับการตั้งครรภ์และการคลอดทั้งของมารดา และทารก ปัจจัยเหล่านั้นได้แก่ จำนวนครั้งที่เคยคลอดบุตร อายุครรภ์ การคาดคะเนน้ำหนักทารก การเปิดของปากมดลูก สภาพของถุงน้ำคร่ำ ภาวะแทรกซ้อนของมารดาขณะตั้งครรภ์ ชนิดของท่าก้นของทารกในครรภ์ และการเป็นผู้ป่วยที่อยู่ในความดูแลของอาจารย์แพทย์หรือไม่*

ผลการศึกษา: *อุบัติการณ์การคลอดทารกท่าก้นทางช่องคลอดในโรงพยาบาลศิริราชเท่ากับ 17.7% ผลการวิเคราะห์เบื้องต้นพบว่า ผู้หญิงที่มีประวัติเคยคลอดมาแล้ว อายุครรภ์ไม่เกิน 32 สัปดาห์ คะเนน้ำหนักทารกไม่เกิน 2500 กรัม ปากมดลูกที่เปิดอยู่ในระยะเร่งของการคลอด ถุงน้ำคร่ำแตกแล้วและไม่ใช่ผู้ป่วยที่อยู่ในความดูแลของอาจารย์แพทย์ ปัจจัยเหล่านี้มีผลเพิ่มโอกาสการคลอดทารกท่าก้นทางช่องคลอดมากขึ้น จากการวิเคราะห์แบบ Multiple logistic regression พบปัจจัยที่เพิ่มโอกาสการคลอดทางช่องคลอดอย่างมีนัยสำคัญทางสถิติ ได้แก่ การเปิดของปากมดลูกที่เปิดอยู่ในระยะเร่งของการคลอด (4-7 เซนติเมตร, adjusted OR 10.7, 95% CI 3.5-33.0; > 7 เซนติเมตร adjusted OR 40.4, 95% CI 12.6-129.2) ถุงน้ำคร่ำแตกแล้ว (adjusted OR 2.9, 95% CI 1.3-6.3) มีประวัติเคยคลอดบุตรมาแล้ว (adjusted OR 6.4, 95% CI 2.6-15.7) และอายุครรภ์น้อยกว่า 32 สัปดาห์ (adjusted OR 9.7, 95% CI 2.7-35.7) อย่างไรก็ตามพบว่าทารกที่คลอดทางช่องคลอด มีคะแนน Apgar ที่ต่ำกว่า และภาวะแทรกซ้อน โดยเฉพาะอย่างยิ่งทารกอายุครรภ์ก่อนกำหนดมากกว่าในกลุ่มที่ได้รับการผ่าตัดคลอด*

สรุป: *จากการศึกษาพบว่าอุบัติการณ์การคลอดทารกท่าก้นทางช่องคลอดในโรงพยาบาลศิริราช 17.7% ของการตั้งครรภ์เดี่ยวที่มีทารกอยู่ในท่าก้น ปัจจัยที่สัมพันธ์กับการคลอดทารกท่าก้นทางช่องคลอด ได้แก่ การเปิดของปากมดลูก การแตกของถุงน้ำคร่ำ มีประวัติเคยคลอดมาแล้ว และอายุครรภ์ก่อนกำหนด*