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Trends in Singleton Breech Delivery in Rajavithi Hospital from 2002-2008

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ABSTRACT

Objectives: To determine the trends in management of pregnant women with breech presentation in Rajavithi Hospital and prognostic factors related to neonatal outcomes

Materials and Methods: A retrospective descriptive study at Rajavithi Hospital from January 1st 2002 to December 31st 2008. Obstetric database and medical records of pregnant women with singleton breech presentation, gestational age more than 28 wks were reviewed. Characteristics of pregnant women, gestational age, parity, type of breech, mode of delivery, maternal and neonatal outcomes were compared.

Results: There were 1,585 women with singleton breech presentation gestational age more than 28 wks. Trend in singleton vaginal breech delivery was declining significantly from 30% to 10% ($p<0.05$). Conversely, trend in singleton cesarean section was increasing from 70% to 90% ($p<0.05$). In the neonates delivered by vaginal breech delivery compared with those delivered by cesarean section, there were some association with poor neonatal outcomes such as, low Apgar score at 1,5 min ($p<0.001$), NICU admission ($p < 0.001$), neonatal intubation ($p<0.001$), maternal hospital stay day ($p<0.001$). If the trend is not change, the cesarean section rate for breech presentation will approved equal 100% in 9.6 years (2012).

Conclusions: Trends in vaginal breech delivery at Rajavithi Hospital had gradually declined.

Keywords: Breech presentation, Cesarean section, Breech delivery, Trend, Rajavithi Hospital

Introduction

Delivery rate of mothers with breech presentation are about 3-4% of all term pregnancy in each year[1]. The complications of vaginal breech delivery are bone fractures, joint dislocation, abdominal organ injuries and intraventicular hemorrhage. The perinatal mortality rate of vaginal breech delivery is 3-5 times more than normal cephalic delivery[2]. The maternal complications can be injury to birth canal, uterine rupture and postpartum hemorrhage.

In 2000, Hannah et al[2] reported that cesarean section was safer than vaginal breech delivery in their randomized controlled study (RCT). This worldwide publication in Lancet may have impact on cesarean section rate in many countries. It is observed that, the rate of cesarean section for breech presentation was increased from 75.3% in 1999 to 86% in 2001 in Sweden[3], from 50% to 80% after 2 months of publishing in Netherland[4] and slightly increase from 83.8% to 85.1% in the USA[5]. The consequence of vaginal

breech can cause children's disability[6], which is not affect only the physical mental of the children themselves but also their families and society. Because of high number of accusation in court nowadays, influence doctors to give more attention of safety in mode of delivery of breech presentation.

Cesarean section itself prolongs the hospital stay and increase risk of surgical infection[7,8]. The consequence of reduction of vaginal breech delivery decreases the doctor's experience[9].

So the main objective of this study is to determine the trends in management of pregnant women with breech presentation in Rajavithi Hospital from the delivery records from January 1st, 2002 to December 31st, 2008. The second objective is to evaluate the prognostic factors related to neonatal outcomes by Apgar score >7 in vaginal delivery group. Knowing of such trends is essential for resident training program and management of health resource allocation such as operative room, operative equipment in the future.

Materials and Methods

This retrospective descriptive study was approved by Rajavithi Hospital's Ethics Committee. Pregnant women, gestational age (GA) 28 weeks or more with singleton breech presentation, who delivered at Rajavithi Hospital from January 1st, 2002 to December 31st, 2008 were enrolled. Baseline obstetric characteristics, such as parity, types of breech presentation, mode of delivery, maternal and neonatal outcomes were analysed. Pregnant women who did not attend antenatal care clinic, had fetal anomalies, previous cesarean delivery, death fetus in utero and infants with congenital anomalies e.g. anencephaly, chromosomal anomalies were excluded.

Statistical analysis was carried out by the SPSS version 17.0 software for Window. Descriptive statistics including mean, frequency, percentage and standard deviation were used to describe baseline obstetric characteristics. Chi-square test and independent t- test were used as appropriate. P-value less than 0.05 were considered significant. Simple linear regression analysis shows trends by equations of linear relationship.

Table 1. Maternal characteristics of breech delivery at Rajavithi Hospital, 2002-2008

Characteristics	Vaginal delivery (N=257) n (%)		Cesarean delivery (N=1,328) n (%)		Total (N=1,585) n (%)		p
Age (Year)							0.042
Mean ± SD	27.04 ± 6.56		27.94 ± 6.02		27.80 ± 6.12		
Median (min-max)	27 (14-45)		28 (14-48)		28 (14-48)		
< 20	37	14.40%	108	8.13%	145	9.15%	
20 – 35	193	75.10%	1065	80.20%	1258	79.37%	
>35	27	10.50%	155	11.67%	182	11.48%	
Gestational age (week)							< 0.001*
Mean ± SD	35.04 ± 4.89		38.14 ± 2.35		37.63 ± 3.13		
Median (min-max)	37 (23-43)		38 (26-44)		38 (23-44)		
< 34	89	34.63%	94	7.09%	183	11.57%	
34 – 36	32	12.45%	109	8.23%	141	8.91%	
>36	136	52.92%	1122	84.68%	1258	79.52%	
Parity							< 0.001*
Nullipara	103	40.08%	817	61.52%	920	58.04%	
Multipara	154	59.92%	511	38.48%	665	41.96%	

Table 1. Maternal characteristics of breech delivery at Rajavithi Hospital, 2002-2008 (cont.)

Characteristics	Vaginal delivery (N=257) n (%)		Cesarean delivery (N=1,328) n (%)		Total (N=1,585) n (%)		p
Type of Beeech							< 0.001*
Frank breech	188	73.15%	808	60.84%	996	62.84%	
Non-Frank breech	69	26.85%	520	39.16%	589	37.16%	
In labor							< 0.001*
Yes	188	73.15%	265	19.95%	453	28.58%	
Ruptured membranes							< 0.001*
Yes	228	88.72%	372	28.01%	600	37.85%	
Mode of delivery							
C/S before labour	0	0.00%	1,070	80.57%	1,070	67.51%	
C/S after labour	0	0.00%	258	19.43%	258	16.28%	
Vaginal breech delivery	257	16.21%	0	0.00%	257	16.21%	

* significant at the 0.01 level

Table 2. Maternal and neonatal outcomes

Characteristics	Vaginal delivery (N=257) n (%)		Cesarean delivery (N=1,328) n (%)		Total (N=1,585) n (%)		p
PPH							0.254
Yes	12	4.67%	87	6.55%	99	6.25%	
No	245	95.33%	1241	93.45%	1486	93.75%	
Length of hospital stay (hr)							< 0.001*
24 - 48	80	35.87%	9	0.72%	89	6.08%	
49 - 72	76	34.08%	49	3.95%	125	8.53%	
73 - 96	35	15.70%	243	19.57%	278	18.98%	
> 96	32	14.35%	941	75.76%	973	66.42%	
Birth weight (gm)				< 0.001*			< 0.001*
Mean ± SD	2222.11 ± 806.43		2949.32 ± 525.93		2831.40 ± 639.31		
Median(min-max)	2435 (350-3670)		2990 (980-4480)		2925 (350-4480)		
< 2000	91	35.41%	71	5.35%	162	10.22%	
2000 – 2499	50	19.46%	149	11.22%	199	12.56%	
2500 – 2999	71	27.63%	451	33.96%	522	32.93%	
3000 – 3499	39	15.18%	483	36.37%	522	32.93%	
3500 – 3999	6	2.33%	155	11.67%	161	10.16%	
≥ 4000	0	0.00%	19	1.43%	19	1.20%	

Table 2. Maternal and neonatal outcomes (cont.)

Characteristics	Vaginal delivery (N=257) n (%)		Cesarean delivery (N=1,328) n (%)		Total (N=1,585) n (%)		p
Apgar score at 1 min							< 0.001*
0-3	61	23.83%	18	1.36%	79	4.99%	
4-7	74	28.91%	185	13.95%	259	16.37%	
> 7	121	47.27%	1123	84.69%	1244	78.63%	
at 5 min							< 0.001*
0-3	26	10.16%	4	0.30%	30	1.90%	
4-7	51	19.92%	31	2.34%	82	5.18%	
> 7	179	69.92%	1291	97.36%	1470	92.92%	
Neonatal intubation	57	22.18%	36	2.71%	93	5.87%	< 0.001*
NICU Admission	58	22.57%	86	6.48%	144	9.09%	< 0.001*
Neonatal death	20	7.78%	3	0.23%	23	1.45%	< 0.001*

* significant at the 0.01 level

Table 3. Multivariable analysis of prognostic factor related to neonatal outcome by Apgar score >7 in vaginal delivery group

Factors	Crude OR	(95%CI of OR)	p	Adjusted OR	(95%CI of OR)	p
Age (Year)						
< 20	0.51	0.29 - 0.88	0.017*	2.13	0.58 - 7.87	0.258
20 – 35	0.96	0.62 - 1.49	0.859	2.47	0.87 - 7.04	0.091
>35	Ref			Ref		
Gestational age (week)						
< 38	Ref			Ref		
≥ 38	3.08	2.34 - 4.05	<0.001*	3.21	1.40 - 7.37	0.006*
Parity						
Nullipara	2.39	1.82 - 3.14	<0.001*	0.58	0.30 - 1.14	0.117
Multipara	Ref			Ref		
Birth weight (gm)						
< 2,500	Ref			Ref		
> 2,500	6.12	4.60 - 8.14	<0.001*	4.91	2.12 - 11.35	<0.001*
Type of Breech						
Frank breech	0.57	0.42 - 0.77	<0.001*	1.49	0.76 - 2.94	0.244
Non-Frank breech	Ref			Ref		

* significant at the 0.01 level

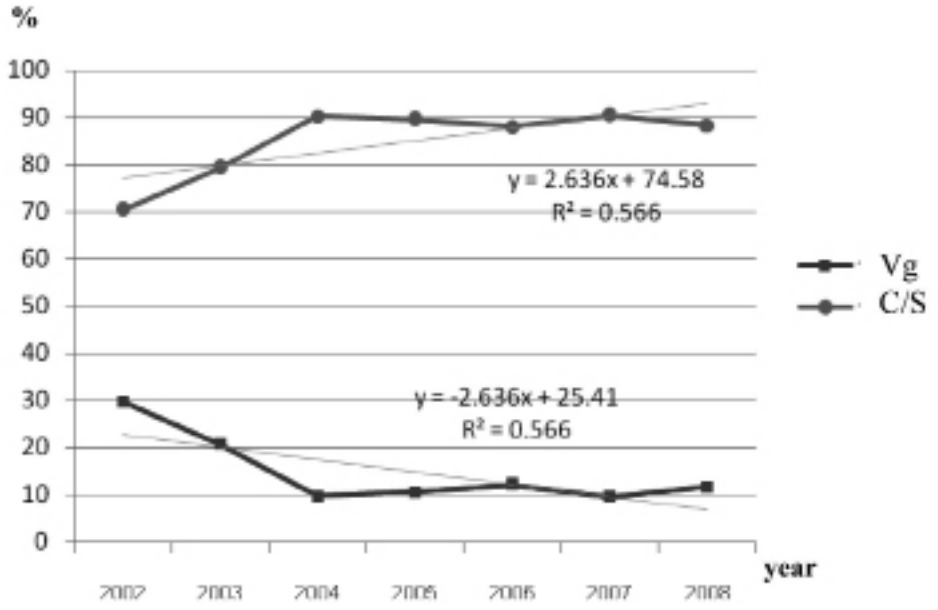

Fig. 1. Trends in breech delivery in Rajavithi Hospital since 2002 to 2008

Results

There were 50,382 total delivery in Rajavithi Hospital since 2002-2008. There were 1,585 cases (3.14%) with singleton breech presentation whose gestational age between 28-42 wks. Among them, 257 cases (16.2%) who were delivered by vaginal breech assisting and 1328 cases (83.8%) who were delivered by cesarean section. Baseline obstetric data of the parturients in this study is summarized (Table 1). Maternal age of vaginal breech delivery was significantly different from the cesarean group ($p = 0.042$). Maternal characteristics were statistically significant, such as the gestational age parity, type of breech, ruptured membrane, and length of hospital stay ($p<0.001$).

Birthweight in the vaginal delivery group was significantly lower than cesarean group. The neonatal intubation, admission and mortality of the vaginal delivery group were statistically significant higher than the cesarean group ($p<0.001$). Apgar scores at 1 and 5 minute of vagina delivery group were significantly lower than the cesarean group ($p<0.001$) (Table 2).

The multivariable analysis of prognostic factors related to neonatal outcome by Apgar score more than 7 in vaginal delivery group were calculated. The significant prognostic factors of preferred vaginal breech delivery were gestational age more than 38 weeks ($p=0.006$) and neonatal birthweight more than 2,500 gm ($p<0.001$).

Trends in breech delivery compared with cesarean delivery. From this graph, vaginal delivery rate declined compared with the cesarean delivery rate. (Fig. 1.) The linear equation were derived by computing using the least square formular where y=cesarean section rate, a = intercept, b = the slope of the line, x = year. For cesarean section equation, it is implied that if the rate is constant for breech presentation, the cesarean section rate for breech presentation will approved equal 100% (y = 100) in 9.6 year (x=9.6) or in the year 2012 (2002+9.6).

Discussion

Management of the term breech delivery has been a controversial issue for several decades and has been decided by only a few retrospective and prospective studies. Hannah et al[2] reported the results of a randomized multicentre trial, which concluded that planned C/S was better for the neonate than vaginal birth without added risk to the mother. Reported rates of vaginal breech delivery were different between studies. In the present study, the incidence of vaginal

breech delivery was about 16.21% similar to the study in Siriraj Hospital (17.7%)[10] and another study in Miami (14.4%)[7]. While a retrospective population-based cohort study of 100,667 in breech presentation at the time of delivery in California reported that 4.9% of these women delivered vaginally[11]. The differences might be due to the differences in patient's characteristics , conditions in each population , protocol, guideline and the differences in the experiences of each hospitals.

Trend of vaginal breech delivery decrease whereas the trend of cesarean breech delivery was increasing in each year (Fig. 1). This trend was similar to the study of Lashen et al[6] reported the continuous significantly increase in the elective cesarean section rate for breech presentation ($p < 0.0001$). Lee HC et al[5] found that breech cesarean section rates from 1997 to 2003 was slightly increased from 83.8% to 85.1%, respectively. However, several factors may interfere the rate of cesarean breech delivery such as no antepartum care, undiagnosed breech presentation, fully dilatation of cervix when admission.

As Table 3, the present study found that there were some possibility of prognostic factors related to good neonatal outcome or Apgar score more than 7. There were gestational age more than 38 weeks, and birth weight more or equal than 2,500 gm. These data may help us to choose the appropriate mode of breech delivery.

Many previous studies reported the better neonatal outcomes in the cesarean compared with vaginal breech delivery such as Apgar score at 5 min, admission to NICU, short term neonatal morbidity, perinatal and neonatal death[2,10,12]. The present study also reported the similar better neonatal results such as neonatal intubation, admission to NICU and neonatal death.

In the present study, linear regression model was used as a technique to relate a dependent variable to an independent variable in the form of a linear equation where considering the strength of the relationship between the variable by using R2 (coefficient of determination) which is equal 0.566. It indicated that only 56.6% of vaginal breech delivery can be attributed to the time (year), so word, mode of delivery was not depend on the year only. So further study should be considered for more powerful method for forecasting such as multiple regression. Linear regression relates one variable to one other independent variable, whereas multiple regression reflects the relationship between a dependent variation and two or more independent variations for example gestational age, estimated fetal weight which are important factors for obstetricians to consider mode of delivery.

Rajavithi Hospital, the biggest tertiary hospital of the Ministry of Public Health, has about 6,000 deliveries per year. Everyday 36 Obstetric and Gynecological residents works in the Department of Obstetrics and Gynaecology. Knowing the trend of breech delivery is essential for resource allocation such as budget earning, experience personal, materials. Providing workshop for training resident, overtime teaching, cases for vaginal breech delivery training under supervision of experience staff. In addition, if the resources was limited, the training institute must have plan to find other collaborative resource institution for support residency training program. This change in trends should have impacts on resident training program in term of operative obstetric skill in the near future.

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แนวโน้มวิธีการคลอดทารกที่มีก้นเป็นส่วนนำในครรภ์เดี่ยวในโรงพยาบาลราชวิถี ตั้งแต่ปี พ.ศ.2545-2551

อภิธาน พวงศรีเจริญ, วัชรพจน์ เอนกรัตน์

วัตถุประสงค์ *: ศึกษาแนวโน้มของการคลอดทารกที่มีก้นเป็นส่วนนำของหญิงตั้งครรภ์เดี่ยวในโรงพยาบาลราชวิถี ตั้งแต่ปี พ.ศ.2545-2551*

วัสดุและวิธีการ *: เป็นการวิจัยเชิงพรรณนาแบบย้อนหลังระหว่างวันที่ 1 มกราคม พ.ศ.2545 ถึง 31 ธันวาคม พ.ศ.2551 โดยทำการสืบค้นข้อมูลจากระบบคอมพิวเตอร์ของสตรีตั้งครรภ์เดี่ยวที่มีก้นเป็นส่วนนำและมีอายุครรภ์มากกว่า 28 สัปดาห์ที่มาคลอดในโรงพยาบาลราชวิถี ในข้อมูลพื้นฐานของหญิงตั้งครรภ์ อายุครรภ์ และผลกระทบที่เกิดขึ้นทั้งมารดาและทารกวิธีการคลอด แล้วนำข้อมูลที่ได้มาคำนวณทางสถิติ*

ผลการศึกษา *: มีหญิงตั้งครรภ์เดี่ยวที่มีส่วนนำเป็นก้นอายุครรภ์มากกว่า 28 สัปดาห์จำนวน 1,585 คนที่ แนวโน้มการคลอดทางช่องคลอดลดลงจากร้อยละ 30 เป็นร้อยละ 10 ($p<0.05$) ในทางกลับกันแนวโน้มการผ่าตัดคลอดเพิ่มสูงขึ้นจากร้อยละ 70 เป็นร้อยละ 90 ($p<0.05$) ทารกที่มีก้นเป็นส่วนนำที่คลอดทางช่องคลอดเมื่อเปรียบเทียบทารกที่มีก้นเป็นส่วนนำ ที่คลอดโดยการผ่าท้องทำคลอดพบว่ามีความสัมพันธ์กับ neonatal outcome, Apgar score at 1,5 min, neonatal admission ($p<0.001$), และ neonatal intubation ($p<0.001$) จำนวนวันที่นอนรักษาตัวในโรงพยาบาล ($p<0.001$) ถ้าแนวโน้มยังไม่เปลี่ยนแปลง อัตราการผ่าท้องทำคลอดสตรีที่มีทารกมีก้นเป็นส่วนนำน่าจะเป็นร้อยละ100 ใน 9.6 ปี หรือภายในปี พ.ศ. 2555*

สรุป *: แนวโน้มวิธีการคลอดทางช่องคลอดของหญิงตั้งครรภ์เดี่ยวที่มีก้นส่วนนำในโรงพยาบาลราชวิถีลดลงอย่างช้าๆ*