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The Effect of Delivery Method on Milk Supply in Breastfeeding Mother Study

Komsak Chuaratanakul, M.D.

Department of Obstetrics and Gynecology, Borabue Hospital, Mahasarakarm, Thailand

ABSTRACT

Objective: To compare the effect of cesarean section to women milk supply, latch score at the 1st and 48th hour postpartum with vaginal route delivery.

Material and Methods: Two hundred pregnant women with uncomplicated delivery from June 1 to September 30, 2014 at Department of Obstetrics and Gynecology, Borabue Hospital, were included. In Group 1 (n=100), the vaginal route group consisted of parturients who had vaginal delivery. In Group 2 (n=100), the cesarean section group consisted of parturients who had cesarean section. Both groups were assessed for milk supply and latch score at the 1st and 48th hour postpartum.

Results: There were no difference in milk supply at the 1st and 48th hour postpartum between the two groups (p = 0.595 and p = 0.790, respectively). Latch score at the 1st hour postpartum in vaginal delivery group was significantly higher than one in cesarean section group (p = 0.000). However, Latch score at the 48th hour postpartum was not statistically different in both groups (p = 0.285).

Conclusion: It is not the method of delivery that influences milk supply at the 1st and 48th hour postpartum but rather the Latch score at the 1st hour in cesarean section that is lower than vaginal delivery group. Health providers need to support the message that milk supply is not affected by method of delivery.

Keywords: milk supply, latch score, vaginal delivery, cesarean section

Correspondence to: *Komsak Chuaratanakul, M.D., Department of Obstetrics and Gynecology, Borabue Hospital, Mahasarakarm, Thailand. Email: komsachua@hotmail.com*

Introduction

Breastfeeding is the preferred method of newborn feeding. Breast milk is the best source of nutrition for infants, especially during the first year of life. Because of breast milk is the best suits for infants' brain growth and physical and intellectual development. It also contains immune for various diseases including the digestive tract and respiratory tract infections. World Health Organization have endorsed breastfeeding as the food source of the first 6 months of an infant's life[1].

To ensure successful breastfeeding, it should begin immediately in the delivery room or within one hour after birth. This is because there is a period when an infant is sensitive to sucking stimulation and the

mother is fully focused on the infant. And infant should be breastfed every two to three hours or whenever requires, for consistency of the production and secretion of prolactin and oxytocin hormones. Properly developed suckling is important for sufficient intake of breast milk, as well as preventing the mother from nipple sores and maintaining consistent lactation.

Delivery by cesarean section is increasing every year. In the United States, cesarean rate in 2012 was 32.8% that exceed 15% of suggestion by World Health Organization[2]. The cesarean rate in Thailand had been increasing continuously from 22.4% in the year 1996 to 34.1% in the year 2008[3]. Cesarean rate in Borabue Hospital also increased from 29% in 2012 to 32.9% in 2013.

The cesarean section is widely believed to affect the breastfeeding. About 35% of women who had cesareans reported that they felt to have insufficient milk supply for their infants[4] but no evident theoretically confirm that perception. Unfortunately this perception causes a lot of women discontinue breastfeeding during the first few weeks of the postpartum period.

Recently National Statistical office reported in the year 2013 that insufficient milk supply is the most commonly reason for cessation of breastfeeding before 6 month postpartum which found approximately 45.5% in Thai women. Then, undoubtedly, the rate of exclusive breastfeeding in 6 month was very low as 12% in 2012 while the expected rate is 30%[5].

The purpose of the study is to determine the effect of cesarean section to women milk supply, latch score at the 1st and 48th hour postpartum compare with vaginal route delivery.

Materials and Methods

Study population

The present study was a prospective analytic studies. The data was collected from two hundred healthy pregnant women who had antenatal care and delivered at Borabue Hospital between June 1 and September 30, 2014. The study received an ethical approval from the Ethical Board of Borabue Hospital ethics committee for human research.

Data collection

All participants gave both written and verbal informed consents before delivery either by vaginal route or cesarean section. Complete history taking included antenatal care history, physical examination were performed. The participants were divided into two groups. The vaginal route group consist of the participants who came to hospital with true labor pain and had vaginal delivery. The cesarean section group consisted of participants who had indication for cesarean section ie. cephalopelvic disproportion, abnormal presentation, previous cesarean section, fetal heart rate anomaly and other finally delivered by cesarean section. The cesarean section group was designed to have the regional analgesia except for fetal distress and other condition that were suitable for the general analgesia. Both groups were encouraged to give breastfeeding to their infant at the first hour after delivery.

Inclusion criteria

1. Healthy pregnant woman who had normal breast and nipple.

2. The pregnant woman had to deliver only singleton.

3. The pregnant woman accepted to participate in the study.

Exclusion criteria

1. The mother who had HIV infection.

2. The mother who had systemic medical disease.

All participants have no abnormal nipples such as nipple fissure or mastitis and have not delivered low birth weight (< 2,500 gram), present of congenital anomaly such as cleft lips-cleft palate, birth asphyxia or referred infant. Following delivery by vaginal route or cesarean section, all of them were free of complications which may interfere with breastfeeding such as postpartum hemorrhage.

The patients were assessed milk supply and latch score before breastfeed their baby at the 1st and 48th hour postpartum during stay in the hospital. Milk supply of cesarean group was assessed at the 1st hour postpartum or slightly after the 1st hour at recovery room

when the patient gained consciousness in cradle position similar to vaginal route group. Both groups were reassessed at the 48th hour before vaginal route group will be discharged from the hospital.

The measurement of milk supply by the test weighing is considered as the gold standard. Unfortunately, the test weighing is costly, invasive and impractical to use in the population studies. Therefore, investigating the milk drops is applied when placing thumb and index finger on the opposite side of each areola then press the fingers towards each other as well as against chest wall. This manner could be repeat 2-3 times and record the best value. The level of milk supply was cathegorized into 4 level; no milk droplet was level 0, 1-2 droplet was level 1, > 2 droplet was level 2 and numerous milk ejection was level 3.

This method was adapted from test weighing and widely used for assessment of milk supply in many public hospitals since it has proposed in the 1st Thai National Breastfeeding meeting[6]. The level of milk supply was related with increasing infant weight after feeding.

The latch score represents: latch, audible swallowing, type of nipple, comfort and hold. Latch assesses the infant's ability to latch onto the breast and evaluates audible swallowing as a determinant of milk intake. Type of nipple indicates the shape, size and texture of the nipple as an important factor in the baby's ability to latch on. Comfort of the breasts and nipples is an indicator of the possible need for adjustments in positioning or another aspect of breastfeeding care. And hold is considered as the breastfeeding position when the mother uses and ability to assume a comfortable and maintains an effective latch[7]. Latch scores were greater or equal to 8 which interpreted as successful breastfeeding scores. Note that latch score of less than 8 refers to lactation consultant[8].

Validation of the instruments

1. Content Validity

The demographic characteristics questionnaire and the milk supply record form were submitted to a panel of four experts to confirm content validity and language appropriateness as follows:

- One obstetrician
- One obstetric nurse
- Two nurses specializing in breastfeeding

The instruments were revised and improved according to the comments and suggestions from several experts before they were tried out with ten nursing mothers whose characteristics were similar to those of the subjects of the main study to assess their understanding of the content and language before another revision.

2. Reliability

The milk supply assessment form was tried out with ten nursing mothers whose characteristics were similar to those of the subjects of the main study. The researcher and one nurse specializing in breastfeeding in the postpartum of Borabue Hospital assessed their milk supply, and the scores were analyzed to determine inter-rater reliability which were rated to 0.8.

The hypothesis of this work is that the milk supply of cesarean section group should be lower if compare to the vaginal route group.

Sample size

Sample size of at least 98 participants per group was calculated from pilot study which two independent proportions of numerous milk ejection were consisted of 0.20 in group 1 (p1) and 0.06 in group 2 (p2) then calculated for sample size. Pilot study was calculated from postpartum mother between 24 to 48 hours.

The sample size would have 80% power to detect the different of both groups with significance at 5% level (α value).

At least ninety-eight participants of each group were a sufficient number to give statistical significance.

Statistical analysis

Statistical analysis was undertaken using SPSS software (version 16.0). Categorical data were analyzed using the Chi-square test or Fisher's exact test, as appropriated. Continuous data were analyzed by using Student's t-test. Normal distributed data were reported by mean and standard deviation. Statistical significance was considered at $p<0.05$.

Result

Healthy fulfilled criteria pregnant women who delivered at Borabue Hospital between June 1 and September 30, 2014 were all enrolled in the study until two hundred. These women were recruited equally into each groups; 100 pregnant women with vaginal delivery and 100 pregnant women with cesarean section delivery, of which 55 had spinal block and 45 had general anaesthesia. All of them were term pregnancy, normal nipples and breast contour, no medical diseases or postpartum hemorrhage. Demographic characteristics of the patients are shown (Table 1). Women in both groups have similar demographic characteristics; marital status, occupation, education, monthy income, maternal age at delivery, pre-pregnancy BMI, total weight gain, height, weight, primigravida, primiparity, received antepartum knowledge about breastfeeding, intended to breastfeeding, infant birth weight, infant weight loss at the 48th hour were not different between 2 groups.

Table 1. Demographic characteristics of mother and infant.

Dermographic characteristics	Vaginal (n=100)	Cesarean section (n=100)	P
Marital status			0.721*
Single	5 (5.0%)	3 (3.0%)	
Married	95 (95.0%)	97 (97.0%)	
Occupation			0.065*
House wife	15 (15.0%)	14 (14.0%)	
Agriculture	53 (53.0%)	39 (39.0%)	
Employee	32 (32.0%)	44 (44.0%)	
Merchant/business	0 (0%)	3 (3.0%)	
Education			0.069
Less than high school	8 (8.0%)	16 (16.0%)	
High school	75 (75.0%)	76 (76.0%)	
University	16 (16.0%)	8 (8.0%)	
Monthy income (baht)			0.122
< 5,000	20 (20.0%)	12 (12.0%)	
5,000-10,000	52 (52.0%)	48 (48.0%)	
> 10,000	28 (28.0%)	40 (40.0%)	
Maternal age at delivery (Mean ± SD)	23.8±6.4	25.1±6.9	0.113
Pre-pregnancy BMI (kg/m^2)	26.3±4.5	26.7±4.0	0.421
Total weight gain (kg)	13.1±5.4	14.3±6.4	0.052
Weight (kg) (Mean ± SD)	65.7±12.0	65.4±11.9	0.488
Height (cm) (Mean ± SD)	157.9±5.7	156.9±10.0	0.492
Primigravida	54 (54.0%)	47 (47.0%)	0.322
Primiparity	59 (59.0%)	56 (56%)	0.775
Received knowledge about breastfeeding	96 (96.0%)	93 (93.0%)	0.352
Intended to breastfeeding	64 (64.0%)	76 (76.0%)	0.064
Infant birth weight (gram) (mean ± SD)	3063.6±337.1	3062.2±337.4	0.977
Infant weigh loss at the 48thhours (gram) (mean ± SD)	98.7±89.0	119.9±79.2	0.077

No significant difference was detected between two groups. *Fisher's exact test.

At the 1st hour postpartum, milk supply was not different between vaginal delivery and cesarean section groups (p = 0.595). Milk supply was mainly in level 0 in both vaginal delivery and cesarean section group (58.0% and 65.0%, respectively). At the 48th hour postpartum, similarly, milk supply was not different between vaginal delivery and cesarean section groups (p = 0.790). Milk supply was mainly in level 2 similarly in both groups (57.0% in vaginal delivery and 54.0% in cesarean section). Interestingly, Latch score at the 1st hour postpartum in vaginal delivery group was significant higher than cesarean section group (p = 0.000). Cesarean group has scored at 6 from 8 which approximately 32% whereas vaginal delivery group has scored at 6 from 9 which about 7%. However, Latch score at the 48th hours postpartum was not statistically different in both groups (p = 0.285).

Table 2. Outcomes of milk supply and latch score at the 1st and 48th hour postpartum stratified by two different routes of delivery.

Outcome	Vaginal (n=100)	Cesarean section (n=100)	P
The 1st hour postpartum			
Milk supply (level)			0.595
0	58 (58.0%)	65 (65.0%)	
1	35 (35.0%)	29 (29.0%)	
2	7 (7.0%)	6 (6.0%)	
3	-	-	
Latch score (level)			0.000*
6	7(7.0%)	32(32.0%)	
7	32(32.0%)	43(43.0%)	
8	49(49.0%)	25(25.0%)	
9	12(12.0%)	-	
The 48th hour postpartum			
Milk supply (level)			0.790
0	-	-	
1	3 (3.0%)	2 (2.0%)	
2	57(57.0%)	54(54.0%)	
3	40 (44.0%)	44 (44.0%)	
Latch score (level)			0.285
9	15(15.0%)	10(10.0%)	
10	85(85.0%)	90(90.0%)	

*P < 0.05

Discussion

Perceived insufficient milk supply is common among postpartum women and is a major reason for early weaning breastfeeding[9-12]. In this study, no significant deviation was found in the demographic characteristics in relation to age, marital status, occupation, education, monthly income, pre-pregnancy BMI, total weight gain, gravity, parity, received knowledge about breastfeeding, intended to breastfeeding, infant birth weight, infant weigh loss at the 48th hours.

The primary outcome was milk supply at

postpartum period among two different routes of delivery. There was no difference in milk supply at the 1st and 48th hour postpartum between vaginal delivery and cesarean section groups. This might be because lactogenesis consists of stage I which starting at the 3rd trimester of pregnancy, following by stage II lactogenesis occurs around the 2nd to 5th day postpartum. When the placenta is delivered, the high level of prolactin combined with decreasing of estrogen and progesterone levels, resulting to the breast alveoli to start producing and secreting milk which known as "Hormonal control" that happens in both vaginal delivery and cesarean section. Whereas stage III, lactogenesis occurs at 8th to 10th day postpartum, milk removal and frequency infant feeding are necessary for long-term milk production (Autocrine control) that might be affected by pain, anxiety or not enough breast suckling[7].

These findings were in agreement with the results from previous studies which demonstrated that even though best practices recommend breastfeeding shortly after birth and frequently thereafter, Kulski et al.,[13] showed that milk removal is not needed for the physiologic changes in mammary epithelium to trigger lactogenesis II (occurs at second to fifth day postpartum). Studies by Woolridge[14] confirmed this when no effect of breastfeeding in the first 24 hours was observed on later milk transfer to the infants.

By contrast, some authors indicate a significantly higher incidence of insufficient milk supply in women who deliver by cesarean section compared with women who deliver by vaginal route. Augustin AL et al.,[15] found that women who had cesarean births and women who were primiparas reported a higher use of formula and breastfed for a shorter duration and the primary reasons for weaning breastfeeding were low milk supply. Unfortunately, this study was the result of query, the feeling of 6 months postpartum. Evans KC et al.,[16] studied the volume of milk transferred to infants born by caesarean section was significantly less than that transferred to infants born by normal vaginal delivery on days 2 to 5 ($p < 0.05$), but by day 6 there was no difference between the two groups ($p = 0.08$). However, there were significant differences between two groups of confounding factors on parity, breast feeding experience, and the first breast feeding time after delivery which may lead to unreliable results.

Latch score, a method for documenting breastfeeding that give the information about mother and infant, at the 1st hour postpartum was significant lower in cesarean group ($p = 0.000$). This finding may be explained by that the cesarean group had negative effect from wound pain, anxiety and limitation of maternal activity from anesthesia. Cakmak & Kuguoglu[17] found that cesarean delivery affects breastfeeding and cesarean mothers need more support, particularly in positioning their babies for breastfeeding. However, when the negative effects from surgery were alleviate, latch score at the 48th hour postpartum was similar for both routes of delivery with no statistically significant difference. Latch score at the 1st hour was unlike milk supply at the 1st hour postpartum that was influenced by hormonal control which drive stage I-II lactogenesis[18,19] automatically in early fifth day postpartum. It was not affected by pain, anxiety or not enough breast suckling.

The limitation of this study was unable to assess the frequency of breastfeeding and supporting from the family which may affected to milk supply. Most of postpartum mothers could not specify the absolute number of breastfeeding at the 48th hour due to communication problem. However, the previous study has demonstrated that no correlation between frequently breastfeeding and the volume of milk which was transferred to the infant in period of the stage I and II lactogenesis.

This study investigates the correct attitude of health providers and the postpartum patients which the milk supply is not correlated with the method of delivery. The milk supply was not decrease during the 1st and 48th hour in the cesarean section group compared to the vaginal delivery group. This information is useful for the hospital or health care staff, including the mother who has a shortage of milk supply after cesarean.

Conclusion

In this study, we found that it is not the method

of delivery that influences milk supply at the 1st and 48th hour postpartum but rather the Latch score at the 1st hour in cesarean section that is lower than vaginal delivery group. However, latch score at the 48th hours is not different. Health providers need to support the message that milk supply is not affected by method of delivery. Breastfeeding should be initiated and maintained until 6 month postpartum confidently regardless of delivery method.

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การศึกษาผลของวิธีการคลอดต่อปริมาณการหลั่งน้ำนมในมารดาให้นมบุตรหลังคลอด

คมศักดิ์ ฉั่วรัตนกุล

วัตถุประสงค์ *: เพื่อศึกษาเปรียบเทียบผลจากการผ่าตัดคลอดต่อปริมาณน้ำนม และประสิทธิภาพการให้นมบุตรหลังคลอด 1 ชั่วโมง และ 48 ชั่วโมง กับการคลอดทางช่องคลอด*

วัสดุและวิธีการ *: หญิงตั้งครรภ์ที่มาคลอดโดยไม่มีภาวะแทรกซ้อนแบ่งเป็น 2 กลุ่ม กลุ่มละ 100 คน โดยกลุ่มแรกเป็นหญิงตั้งครรภ์ที่คลอดทางช่องคลอดได้สำเร็จ และกลุ่มที่สองเป็นหญิงตั้งครรภ์ที่มีข้อบ่งชี้ในการคลอดด้วยการผ่าตัดคลอด ทั้งสองกลุ่มได้รับการประเมินปริมาณการหลั่งของน้ำนม และประสิทธิภาพการให้นมบุตรหลังคลอด 1 ชั่วโมง และ 48 ชั่วโมง*

ผลการศึกษา *: ไม่พบความแตกต่างของปริมาณการหลั่งน้ำนมหลังคลอด 1 ชั่วโมง และ 48 ชั่วโมง ($p=0.595$ และ $p=0.790$ ตามลำดับ) แต่พบว่าประสิทธิภาพการให้นมบุตรหลังคลอด 1 ชั่วโมง ในกลุ่มที่คลอดทางช่องคลอดสูงกว่ากลุ่มที่ผ่าตัดคลอดอย่างมีนัยสำคัญ ($p=0.000$) ส่วนประสิทธิภาพการให้นมบุตรหลังคลอด 48 ชั่วโมง ไม่พบความแตกต่างอย่างมีนัยสำคัญทางสถิติระหว่างทั้งสองกลุ่ม*

สรุป *: ไม่พบว่าวิธีการคลอดมีผลต่อปริมาณการหลั่งน้ำนมหลังคลอด 1 ชั่วโมง และ 48 ชั่วโมง แต่ประสิทธิภาพการให้นมบุตรหลังคลอด 1 ชั่วโมง ในกลุ่มที่ผ่าตัดคลอดต่ำกว่ากลุ่มที่คลอดทางช่องคลอด ผู้ให้บริการทางการแพทย์ควรให้คำแนะนำให้เกิดความมั่นใจแก่หญิงหลังคลอดได้ว่าวิธีการคลอดไม่มีผลต่อปริมาณการหลั่งน้ำนม*