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The Onset of Lactation After an Uncomplicated Cesarean Delivery: A Randomized Controlled Study Between Early Post Operative Feeding and Conventional Feeding

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ABSTRACT

Objective: To compare the onset of lactation after an uncomplicated cesarean delivery between early feeding and conventional feeding.

Material and methods: One hundred and forty – four uncomplicated post cesarean mothers were enrolled. Seventy-two of them were randomized into each group. The study group had early feeding while the control group started feeding with the conventional method. Demographic data were collected. The onset of lactation were interviewed, confirmed and recorded from both groups. The normal distributed data were described in mean, standard deviation and compared by independent t-test. The Chi-square test and two-tailed t-test were used to analyze the categorical and continuous data. Statistical significance was considered when p value < 0.05.

Result: There was no difference in demographic data between the study and control group. The onset of lactation in the study and control group were 43.55$\pm$13.58 hrs and 56.40$\pm$11.23 hrs, respectively. The onset of lactation in the study group was significantly lesser than the control group (P < 0.001).

Conclusion: The early feeding in uncomplicated post caesarean mothers had earlier onset of lactation than the conventional feeding.

Key words: onset of lactation, early feeding, caesarean section

Introduction

Lactogenesis or initiation of the capacity of the breast for milk secretion, has been conceptually divided into 2 stages [1,2]. Stage I begins as early as 12 weeks prior to birth. The high levels of prolactin during pregnancy do not usually increase large volumes of milk production due to the antagonism of progesterone hormone. Stage II typically occurs around day 2-3 postpartum, resulting in a copious increase in milk volume, often referred to by the mother as the "milk coming in", the first sudden sensation of breast fullness, engorgement and milk leakage after birth and may indicate a milk supply that is more than adequate[3] for exclusively breastfeeding for 6 months [4].

The first week postpartum is a critical period for the establishment of breastfeeding. During this time, both the mother and her infant are learning how to

breastfeed.[5] There are some barriers to the initiation of breastfeeding including cesarean section[6,7]. The mechanism by which cesarean section affects breastfeeding initiation is thought to be related to the fact that this surgical procedure has a longer recovery period than a vaginal birth.[8] Both planned delay in oral intake of fluid and food after operation with preoperative dehydration and possible serious post operative complications including pain, uterine hemorrhage, infections and loss of mobility in the mother, may affect the process of breastfeeding.

The rates of cesarean delivery have increased dramatically during the last decades in the United States and worldwide including Thailand[9]. In Thailand, cesarean section rates has increased steadily from 15.2% in 1990 to 22.4% in 1996[10]. Cesarean delivery rate had increased consistently in most of the hospitals including 78% of the general hospitals, 50% of the private hospitals, 66% of the university hospitals[11]. Chao Praya Yomaraj Hospital has also shown a rapid increase in cesarean section rate from 44.3% in 2006 to 51.3% in 2009.

Early feeding after uncomplicated cesarean delivery had reduced the rate of ileus symptoms, mean time interval to bowel movement, duration of intravenous fluid administration and length of hospital stay. It is suggested that the early feeding regimen should be considered as it saves cost and offers benefits to the patients such as less suffering from thirst, hunger, early ambulation and shorter hospital stay[12,13] as well as increases patient wellbeing[14]. At present time the success rate of breastfeeding is lower than expected. The present study aimed to examine the quick response of the early postoperative feeding on the onset of lactation. This intervention may make mother more confident leading to successful exclusive breastfeeding with expected exclusive breastfeeding time.

Materials and Methods

The study recruited pregnant women who had cesarean delivery at Chao Praya Yomaraj Hospital between May 2010 and July 2010. The institutional ethics committee approved the study protocol, written informed consent was obtained from each participant. All patients were counseled by the author and invited to participate such as in the study. They have no systemic medical disease ie. diabetes mellitus and hypertension. All subjects had more than 8 hrs. of no oral intake before surgery. All had intention of breastfeeding and had normal nipples. Following cesarean delivery, all of them were free of complications which may interfere with breastfeeding initiation within the first 12 hrs. postpartum. None had use the medications that contraindicated with breastfeeding and HIV infection.

Neonatal inclusion criteria were healthy, singleton, delivery at term with birth weights of more than 2.5 kg, no birth asphyxia and with the absence of congenital anomaly such as cleft lips, cleft palate. The patients were assigned to the early feeding group (at 8 hrs after operation) or the conventional feeding group (at 24 hrs) by simple random sampling method using the table of random numbers[15] The early feeding group started drinking water 250 ml. at 8 hrs. after surgery, received a liquid diet followed by a soft diet and then a regular diet as tolerated. The Foley's catheter was removed at the same time as the intravenous line.

Chao Praya Yomaraj Hospital had been filled with a Certificate of Intent with the Baby Friendly Hospital Initiative. Thus, this research was conducted in the environment supportive of breastfeeding[16]. Women received breastfeeding assistance in the postpartum ward. Rooming-in was encouraged. As soon as mother recovered from operation and became conscious, newborn was brought to her, and the mother is encouraged to give frequent, effective and early suckling, lying comfortably on her side or any positions comfortable from pain of operative wound.

The measurement of milk transfer by test weighing is considered to be the "gold standard" for documenting lactogenesis stage II. Unfortunately, test weighing is costly, invasive and impractical to use in population studies. Assessment of the onset of lactation began after delivery. To evaluate the clinical symptoms of lactogenesis, subjects were interviewed by the author three times daily regarding breast symptoms (i.e. breast fullness, swelling, leakage, milk ejecting from the other breast when infant was sucking). Subjects

were asked "Has your milk come in yet?" If the response was positive, the subject was then asked, "When did your milk come in?" and examined to confirm again. The response of the patient and the confirmation of the author was recorded as soon as possible.

The sample size of 32 participants per group was calculated from pilot study which provided mean of two groups and standard deviation of 42.20±16.06 and 54.84±14.69 with 10% for drop out, alpha error of 0.05 and power of 90%. Sample was doubled which equaled to 72 per group.

Categorical data were analyzed using the Chi-Square test. Continuous data were analyzed by using a two-tailed t-test with P value < 0.05 chosen as significant. Normal distributed data were reported by mean and standard deviation, and means were compared by independent t-test.

Results

One hundred and forty four patients with uncomplicated cesarean delivery were enrolled in the study; 72 women were assigned to the early feeding regimen and 72 women were assigned to the conventional feeding regimen. Mean age of the early and conventional feeding groups were 27.08±7.16 and 29.58±6.55 years, respectively. The youngest was 14 years old and the oldest was 45 years old. All of them were term pregnancy, normal nipples, no medical diseases such as diabetes mellitus, hypertension or hypertensive disease of pregnancy. Almost all women were primipara. Some had previous breastfeeding experience (30, 38 persons in each group). All of them had intention of breastfeeding which average 7.49±3.37 and 6.44±3.43 months. Women in both groups had similar demographic characteristics; including age, parity, gravidity, BMI, estimated blood loss, mean maternal urine specific gravity at 8 hrs. after operation but there was a significant difference in onset of lactation and the urinary specific gravity at 24 hrs. post operation (Table1).

The most common indication for caesarean delivery was cephalo-pelvic disproportion. Spinal anesthesia was used in 56.9% and 69.4% in the early feeding and conventional feeding group, respectively. Infant weight loss at 72 hrs was minimum, approximate 5% of body weight, that means only physiologic weight loss occurs except 4 infants of conventional feeding group. One infant lost 11.29% of body weight because his mother had a delayed onset of lactation (79 hrs). Her urinary specific gravity at 24 hrs was 1.029 which was higher than the urinary specific gravity at 8 hrs of 1.027. This is contrary to almost all of the rest of the women (97.92%). This may indicate that his mother has mild dehydration that may reflect low milk production. The other three mothers' had BMI of 26.23, 26.76 and 35.20 Kg/m^2, respectively.

Only one patient developed mild symptoms of ileus which resolved spontaneously or improved by oral anti-flatulence within a few hours.

The mean onset of lactation in early and the conventional feeding group were 43.55±13.58 hrs. and 56.40±11.23 hrs, respectively. This difference was statistically significant (P<0.001). In early feeding group, the minimum onset of lactation was 6 hours and no delay of onset of lactation. In the conventional group the minimum was 34 hrs and the maximum was 85 hrs. Almost all the patients had onset of lactation time between 24-60 and 36-72 hours in each group after delivery (Table 3, Graph 1). The onset of lactation in multiparity is shorter than in primiparity in the conventional feeding group (Table 4).

In the conventional feeding group, 8 participants had a delayed onset of lactation (more than 72 hours) with the mean of 77. 37 hours. They had BMI ranging from 17.58 to 23.37 kg/m^2 with the mean BMI of 20.69 kg/m^2.

Table 1. Demographic characteristics of mother and infant

Demographic characteristics	Early feeding group.	Conventional feeding group	P value
Age (yr) (mean ± SD)	27.08 ± 7.16	29.58 ± 6.554	0.031**
Previous breastfeeding experience	30 (41.7%)	38 (52.8%)	0.182
Primiparity	43 (59.7%)	38 (52.8%)	0.401
BMI (pre pregnant weight in kg/m^2) (mean ± SD)	22.64 ± 4.53	21.90 ± 3.74	0.290
Hct (%) (mean ± SD)	35.31 ± 4.77	34.94 ± 2.69	0.568
Estimated blood loss (ml) (mean ± SD)	395.14 ± 84.82	383.33 ± 68.69	0.360
Urinary specific gravity at 8 hr (mean ± SD)	1.020 ± 0.005	1.025 ± 0.024	0.066
Urinary specific gravity at 24 hr (mean ± SD)	1.008 ± 0.005	1.012 ± 0.008	0.001**
Infant birth weight (gm) (mean ± SD)	3213.96 ± 468.94	3140.69 ± 321.39	0.276
%infant weight loss at 72 hrs (mean ± SD)	4.905 ± 3.07	5.69 ± 2.50	0.097

P value (Unpaired Student-T test) with statistic significance ** <0.05

BMI = body mass index. Hct = haematocrit.

Table 2. Timing of onset of lactation between early and conventional feeding group

Onset of lactation (hrs)	Early feeding group	Conventional feeding group
Min	6	34
Max	71	85
Mean ± SD**	43.55 ± 13.58	56.40 ± 11.23

P value (Unpaired Student-T test) with statistic significance **0.000

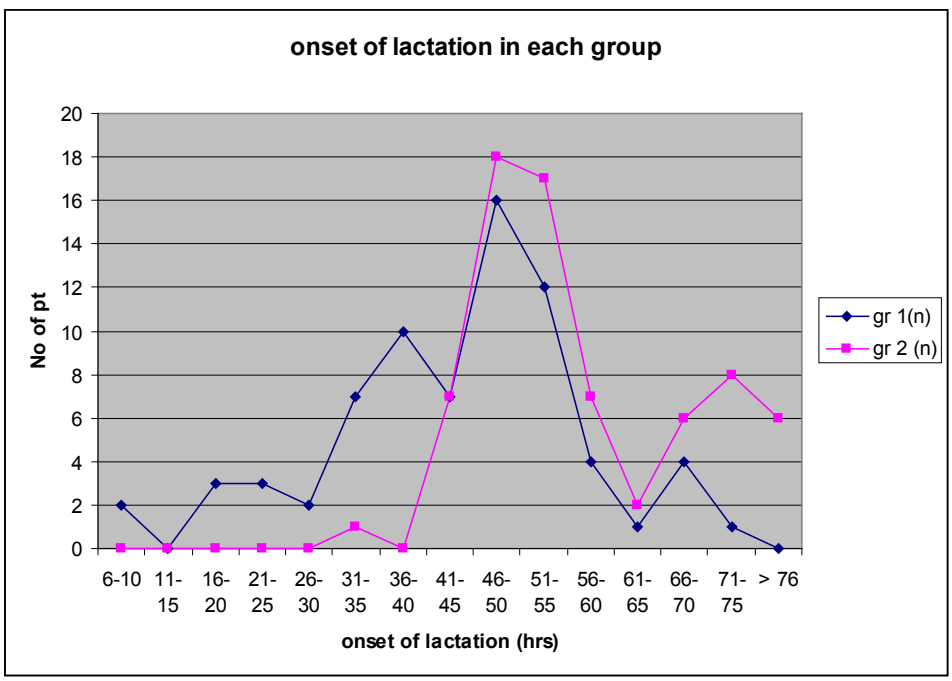
Table 3. Interval of the onset of lactation compared with early and conventional feeding group

Onset of lactation (hrs)	Early feeding group (n = 72)	Conventional feeding group (n = 72)
≤ 24	8	0
> 24 - 36	12	1
> 36 – 48	25	17
> 48 – 60	21	34
> 60 – 72	6	12
> 72	0	8

Table 4. Correlation between primiparous mothers and multiparous mothers on the onset of lactation

	N (144)	Onset of Lactation In hrs.	P
Early feeding	72		
Primiparity	43	45.64 ± 12.30	
Multiparity	29	40.46 ± 14.96	0.113
Conventional Group	72		
Primiparity	38	59.30 ± 10.80	
Multipaity	34	53.16 ± 10.95	0.019**

P value (Unpaired Student-T test) with statistic significance ** <0.05



Graph 1. Distribution of onset of lactation between early feeding (gr 1) and conventional feeding (gr 2)

Discussion

To our knowledge, the present study is the first study about correlation of the onset of lactation after an uncomplicated cesarean delivery between early feeding and conventional feeding groups. Kulski J et al[8] found that time onset of lactation in women who delivered normally and those who delivered by cesarean delivery were 59±16.3 hrs and 63.6±24.2 hrs, respectively. So we correlate that onset of lactation of early feeding of patient undergoing cesarean delivery in both groups was similar to those delivered normally.

Forth-eight hours during 48 hrs. after cesarean delivery more than one half of mothers (48 patients) in the early feeding group have onset of lactation (Table 3 and graph 1) while only 18 patients in conventional feeding group have onset of lactation (Table3). This study found that early feeding has shortened the onset of lactation. The difference of mean age in both group (1.50 yrs) had statistical significance but no clinical significance.

We found that urine specific gravity of two groups at 8 hours postoperative have no statistical significance that means the status of hydration of both groups are the same control standard but the urine specific gravity at 24 hrs of early feeding group had lesser than urine specific gravity of conventional feeding group with statistical significance. This would support that more hydration occur in early feeding group.

Early feeding also reduces distressing symptoms such as thirst, hunger, as well as improve patients' satisfaction while no side effects were encountered. Early and increase mobilization further reduced stress of confinement to bed. Stress during labor and delivery is conducive to a delayed onset of lactation[17]. The result from this study may lead to early feeding after cesarean sectioned.

We found that multiparous mothers had an onset of lactation earlier than primiparous mothers (Table4). This difference is statistically significant (p = 0.04, 0.019) similarly to the report from Guatemala[18].

Mothers with BMI >27 kg/m^2 were 2.5 times more likely to have a delay onset of lactation than mothers with a lower BMI[5]. Three participants which had infant weight loss of more than 10% at 72 hrs, have an average BMI of 26.23, 26.76 and 35.20 similar to the Guatemalan study but 8 participants who have delayed onset of lactation had a low level of BMI (mean=20.69). There is no detectable relationship between maternal BMI and the detected milk volume[19]. There is no suitable value of BMI for the best benefit of onset of lactation for healthy infant.

In conclusion, early feeding after uncomplicated cesarean section had reduced the time for the onset of lactation. This was perceived by the mother herself. A quicker return to normal feeding habits and early ambulation makes her feel normal and not as a surgical patient. This study shows that the onset of lactation in early feeding group as less than in the conventional group. This difference is statistically significance (P<0.001). Multiparous mother had an onset of lactation earlier than primiparous mother, with statistical significance in the conventional group (p = 0.019). A delay onset of lactation was not found in early feeding group but was found in11.11% of the conventional feeding group.

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การเริ่มหลั่งของน้ำนมเต็มเต้าในมารดาหลังการผ่าตัดคลอด: การศึกษาแบบ Randomized controlled trial เปรียบเทียบระหว่างการรับประทานอาหารเร็วและการรับประทานอาหารตามขั้นตอน

นลินี เดียววัฒนวิวัฒน์

วัตถุประสงค์ *: เพื่อศึกษาระยะเวลาของการเริ่มหลั่งของน้ำนมเต็มเต้าในมารดาหลังการผ่าตัดคลอดเปรียบเทียบระหว่างการเริ่มรับประทานอาหารเร็วและการรับประทานอาหารตามขั้นตอน*

วัสดุและวิธีการ *: มารดาที่ได้รับการผ่าตัดคลอดและไม่มีภาวะแทรกซ้อนจำนวน 144 รายถูกสุ่มแบ่งเป็น 2 กลุ่ม กลุ่มละ 72 ราย กลุ่มทดลองเริ่มให้รับประทานอาหารเร็ว กลุ่มควบคุมให้รับประทานอาหารตามขั้นตอนแบบเดิม บันทึกระยะเวลาเริ่มของการหลั่งน้ำนมมารดาทั้ง 2 กลุ่มโดยการสัมภาษณ์ ตรวจสอบหาค่าเฉลี่ยของข้อมูลที่มีการกระจายปกติ ค่าเบี่ยงเบนมาตรฐาน และวิเคราะห์เปรียบเทียบโดยใช้ independent T-test การวิเคราะห์ข้อมูลกลุ่ม และข้อมูลต่อเนื่องใช้ Chi-square test และ two-tailed t-test โดยใช้นัยสำคัญทางสถิติที่ P value < 0.05*

ผลการศึกษา *: มารดาทั้งกลุ่มทดลองและกลุ่มควบคุมไม่มีลักษณะพื้นฐานที่แตกต่างกัน ระยะเวลาของการหลั่งน้ำนมในมารดากลุ่มทดลองที่เริ่มให้รับประทานอาหารเร็วคือ 43.55 $\pm$ 13.58 ชั่วโมง เปรียบเทียบกับกลุ่มควบคุมที่ให้รับประทานอาหารตามขั้นตอนเดิมคือ 56.40 $\pm$ 11.23 ชั่วโมง ซึ่งแตกต่างกันอย่างมีนัยสำคัญทางสถิติ (P < 0.001)*

สรุป *: มารดาที่ได้รับการผ่าตัดคลอดและไม่มีภาวะแทรกซ้อนที่เริ่มรับประทานอาหารเร็วมีระยะเวลาที่เริ่มการหลั่งน้ำนมสั้นกว่ามารดาที่ให้รับประทานอาหารตามขั้นตอนแบบเดิม*