Impact of Bottle Feeding Prohibition on Exclusively Breastfeeding

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Objective: *To compare the time of colostrum expression and quantity of breast milk between early postpartum women who practiced exclusively breastfeeding and who had combined breast and bottle feeding.*
Material and Method: *Seventy mothers who delivered term normal, singleton infants were voluntarily recruited during immediate postpartum period and allocated into two groups. Study group was 35 mothers who practiced exclusively breastfeeding and 35 mothers who practiced combined breast and bottle feeding were control group. Expression of colostrum at 12, 24, and 48 hours and quantity of breast milk at 48 hours after delivery were evaluated and compared between two groups.*
Results: *At 12 and 24 hours after delivery, 65.7% and 88.6% of study group had colostrum compared to 37.1% and 68.6% in control group, respectively. The difference was significantly higher in study group. However, at 48 hours after delivery, there was no statistical difference in both groups. Quantity of breast milk at 48 hours after delivery was 5 mL (2, 10) in the study group compared to 2 mL (0,8) in the control group, which was significantly different.*
Conclusion: *Exclusively breastfeeding since immediate postpartum significantly promote earlier expression of colostrum and higher quantity of breast milk.*

Keywords: *Breastfeeding, Bottle feeding, Colostrum*

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Currently the value of breastfeeding is being more and more recognized. In Thailand, according to the Eight Socioeconomic Development Plan, the government declared a goal of 30% exclusively breastfeeding in the first 4 months of infancy, which echoed UNICEF's strategies and WHO's BFHI (Baby Friendly Hospital Initiative).

Benefits of breastfeeding are clearly demonstrated in developing countries. Breastfeeding not only facilitates infants' growth and development but also significantly decreases the incidence of infectious diseases such as otitis media and diarrhea[1,2]. Immediate breastfeeding after delivery encourages uterine contraction and helps the mothers regain their figures quickly. The women who breastfeed their babies usually have longer periods of infertility. Moreover, breastfeeding is cheap, always available and most importantly strengthens mother and child bonding[3,4]. However, the main obstacles of breastfeeding are preferred bottle and early weaning, which is a consequence of early bottle feeding. This problem of "nipple confusion"[5] occurs as the different mechanism of fetal suckling[6] between two methods of feeding i.e., breast vs. bottle. Even though there are many theories describing the negative effect of bottle feeding against breastfeeding, the number of randomized control trials is still limited. The objective of the present study was to compare the time of colostrum expression and quantity of breast milk between early postpartum women who practice breastfeeding exclusively and who had combined breast and bottle feeding.

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Material and Method

From April to June 2005, postpartum women who delivered at Ramathibodi Hospital were recruited. The studied subjects were primipara who had a normal

prepregnant body mass index (BMI)[7] and vaginally delivered normal singleton babies. They had no disease or condition that was a limitation to breastfeeding or necessitated supplementary feeding. Infants were normal term babies with birth weight between 2,500 and 4,000 grams and without birth asphyxia[8]. Infants who developed jaundice within 48 hours after delivery were excluded.

After informed consent, the volunteer mothers were allocated into two groups by their intention. The study group was mothers who practiced breastfeeding exclusively and the control group was mothers who had combined breast and bottle feeding. Study group did not receive any formula milk and nursed their babies by breast milk alone at least every 3 hours. The control group received formula milk and nursed their babies by both bottle and breast milk according to their convenience which was a regular practice in Ramathibodi Hospital.

From the pilot study, 65% of mothers of exclusive breastfeeding had colostrum expressed at 12 hours after delivery compared to 30% among mothers of combined breast and bottle feeding. By using one tailed test with type I error = 0.05 and power of the present study at 0.9, the sample size in each group was calculated as 35.

Expression of colostrum was evaluated at 12, 24, and 48 hours after delivery by specially trained nurses. Appearance of colostrum was recorded. Expression of breast milk was also done by using an electrical breast pump. Breast pump was done only on the right breast after 1 minute massage of the breast at 3 hours since the last time of breastfeeding. At least 5 minutes breast pump was applied each time to empty the breast with a suitable pumping cup.

Data were analyzed using median, mean, standard deviation, percentile and the Fisher's exact test, t-test, Chi-square test and Mann-Whitney test when applicable. A p-value < 0.05 was considered a statistically significant difference.

Results

Seventy mothers were voluntarily recruited and equally allocated in both groups. The age, prepregnant body weight, and weight at delivery were not significantly different in both groups (Table 1). The infants' general characteristics were not significantly different between the two groups (Table 2). The percentage of mothers whose colostrum was expressed at 12 hours after delivery was significantly higher (65.7% in the study group compared to 37.1% in the control group). At 24 hours after delivery, 88.6% in the study group had colostrum compared to 68.6% in the control group, which was also significantly different. However, at 48 hours after delivery, the percentage of mothers with colostrum expressed was not significantly different between both groups (Table 3). When a breast pump was applied at 48 hours after delivery, the quantity of breast milk was significantly different when comparing the median amount of breast milk in each group (5 mL in the study group compared to 2 mL in the control group) (Table 4).

Table 1. Comparison of maternal characteristics between study group and control group

Characteristics	Study group $\bar{X} \pm$ SD (n = 35)	Control group $\bar{X} \pm$ SD (n = 35)	p-value
Age (yr)	23.7 ± 5.1	25.7 ± 5.1	0.18
Prepregnant weight (kg)	51.2 ± 7.8	48.9 ± 6.1	0.19
Weight at delivery (kg)	64.2 ± 7.4	62.9 ± 10.8	0.55

Table 2. Comparison of infant characteristics between study group and control group

Characteristics	Study group (n = 35)	Control group (n = 35)	p-value
Sex			
Male (n, %)	17 (48.6)	17 (48.6)	
Female (n, %)	18 (51.4)	18 (51.4)	
Birthweight (g) ($\bar{X} \pm$ SD)	3,185 ± 345	3,106 ± 344	0.34

Table 3. Comparison of colostrum expression at 12,24 and 48 hours after delivery between study group and control group

Colostrum expression	Study group (n, %) (n = 35)	Control group (n, %) (n = 35)	p-value
12 hours after delivery			
Yes	23 (65.7)	13 (37.1)	0.02
No	12 (34.3)	22 (62.9)	
24 hours after delivery			
Yes	31 (88.6)	24 (68.6)	0.04
No	4 (11.4)	11 (31.4)	
48 hours after delivery			
Yes	34 (91.7)	30 (85.7)	0.20
No	1 (2.9)	5 (14.3)	

Table 4. Comparison of breast milk volume at 48 hours between study group and control group

Breast milk volume (mL)	Study group (n = 35)	Control group (n = 35)	p-value
Median (25^{th}, 75^{th}percentile)	5 (2,10)	2 (0, 8)	0.02*

***Mann-Whitney test

There were two mothers who had cracked and sore nipples, one was in the exclusively breastfeeding group who did not express breast milk within 48 hours and the other one was in the combined breast and bottle feeding group.

Discussion

There are many theories describing the negative effect of bottle feeding against breast milk production. The "nipple confusion" effect described the inability of babies to suckle the breast effectively[5]. This experimental study showed the positive effect of exclusively breastfeeding on breast milk production. The results of this present study showed that the percentage of mothers who had colostrum expressed at 12 and 24 hours were significantly higher among mothers in exclusively breastfeeding group. The quantity of breast milk at 48 hours after delivery among mothers of exclusively breastfeeding was also significantly higher than mothers of combined breast and bottle feeding. Findings from this present study confirmed that effective fetal suckling induced earlier expression and a larger quantity of breast milk production and lactation. Ullah and Griffiths' study[9] also showed that the use of a pacifier caused nipple confusion and shortened breastfeeding duration.

In conclusion, colostrum was expressed earlier among mothers of exclusively breastfeeding and more breast milk was obtained at 48 hours after delivery. Exclusively breastfeeding for healthy infants should be encouraged and adapted as a policy to be practiced in the hospital.

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ผลของการงดใช้ขวดนมในการส่งเสริมการเลี้ยงทารกด้วยนมมารดาอย่างเดียว

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วัตถุประสงค์: *เพื่อศึกษาเปรียบเทียบการหลั่งน้ำนมเหลือง และปริมาณน้ำนมหลังคลอด ระหว่างมารดาที่เลี้ยงทารกด้วยนมมารดาอย่างเดียว กับมารดาที่ให้ทารกดูดนมเสริมจากขวดร่วมด้วย*

วัสดุและวิธีการ: *เป็นการศึกษาเชิงทดลองในมารดาครรภ์เดี่ยวที่คลอดปกติครบกำหนดและทารกปกติที่โรงพยาบาลรามาธิบดี ระหว่างเดือนเมษายน – มิถุนายน พ.ศ.2548 จำนวน 70 ราย โดยแบ่งเป็น 2 กลุ่ม ตามความสมัครใจ กลุ่มศึกษาให้มารดาเลี้ยงทารกด้วยนมแม่อย่างเดียว ส่วนกลุ่มควบคุมให้ทารกดูดนมเสริมจากขวดนมร่วมด้วยตามความพอใจของมารดา โดยมีกลุ่มละ 35 คน ทำการวิเคราะห์เปรียบเทียบการหลั่งน้ำนมเหลืองที่เวลา 12, 24 และ 48 ชม. หลังคลอด และปริมาณน้ำนมที่หลั่งได้ที่ 48 ชม. หลังคลอด*

ผลการศึกษา: *ภายหลังคลอด 12 ชม. และ 24 ชม. กลุ่มศึกษามีการหลั่งน้ำนมเหลืองร้อยละ 65.7 และร้อยละ 88.6 เปรียบเทียบกับกลุ่มควบคุมร้อยละ 37.1 และร้อยละ 68.6 ตามลำดับ ซึ่งมีความแตกต่างอย่างมีนัยสำคัญทางสถิติทั้งที่เวลา 12 และ 24 ชม. หลังคลอด ส่วนที่เวลา 48 ชม. หลังคลอด การหลั่งน้ำนมเหลืองในทั้ง 2 กลุ่มไม่แตกต่างกัน ในส่วนของค่ามัธยฐานของปริมาณน้ำนมที่ 48 ชม. ในกลุ่มศึกษาเท่ากับ 5 มล. (2,10) เปรียบเทียบกับกลุ่มควบคุม 2 มล. (0,8) ซึ่งมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติเช่นกัน*

สรุป: *มารดาที่เลี้ยงทารกด้วยนมแม่อย่างเดียว มีการหลั่งน้ำนมเหลืองเร็วกว่า และมีปริมาณน้ำนมที่มากกว่ามารดาที่ให้ทารกดูดนมเสริมจากขวดร่วมด้วยอย่างมีนัยสำคัญทางสถิติ*