The Efficacy of Hospital-Based Food Program as Galactogogues in Early Period of Lactation

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Objective: *Galactogogue food has been frequently used among lactating women without reported efficacy data. The present study was aimed to address the outcome of hospital-based food programs as defined by the onset of lactation and infant's weight loss.*

Material and Method: *A Quasi-experimental design was done to compare the maternal breast fullness/heaviness and infants' body weight among 106 women in galactogogue group and 127 controls. Data was gathered daily from the 1st day of postpartum through the date discharged regarding timing of first breast feeding, nursing frequency, LATCH score, non-breast-milk fluid, breast fullness/hardness, leakage of colostrum/breast milk, let-down reflex and infants' body weight.*

Results: *Maternal report of breast fullness/heaviness within the first 48 hours in galactogogue group was significantly more than control (71.7% and 56.7%, respectively; $p<0.001$). Proportion of infant who had an excessive weight loss, as defined by weight loss more than 7% within the first 48 hours, in galactogogue group was significantly lower than controls (15.1% and 24.4%, respectively; $p = 0.043$).*

Conclusion: *The use of traditional food as hospital-based food program had some efficacies in the early period of lactation, regarding presence of breast fullness and reduction of infant's weight loss. However, the efficacy in maintaining breast milk production should be further studied. Likewise, frequent breastfeeding and thorough emptying of breasts definitely result in increased milk production and should be evaluated in all lactating women.*

Keywords: *Galactogogue, Breastfeeding, Lactation, Excessive weight loss*

J Med Assoc Thai 2014; 97 (5): 478-82
Full text. e-Journal: *http://www.jmatonline.com*

The critical period for success in breast-feeding is the first week of postpartum. The production of breast milk is minimal during the first few days of postpartum, and usually increases by the 2nd-3rd day of postpartum in the response to the drop in progesterone level[1]. Nevertheless, thirty-one percent of breastfeeding mothers reported to have delayed onset of milk productions (≥72 hours postpartum)[2]. Delayed onset of lactation is associated with maternal perceived insufficient milk[3], results in the early introduction of supplemental feeding before the onset of lactation and the shorter duration of breastfeeding[4,5]. Risk factors for delayed onset of lactation included primiparity[2,6,7], delivered by cesarean section[2,7], vaginal delivery with prolonged 2nd stage of labor[2,8], maternal obesity[2], flat or inverted nipples, infants' birth weight less than 8 lbs, and exclusive formula-feeding before the onset of lactation[2]. Inadequate milk intake in early lactation, from either inadequate maternal milk volume or poor breast feeding technique, causes excessive neonatal weight loss. Weight loss of greater than 7% from birth weight indicates breastfeeding problems and needs intensive evaluation to correct the problems, improve milk production and transfer[9]. Neonatal excessive weight loss has been reported to occur in 8-12% of breast-fed infants within the first week[8,10].

Galactogogues are medications, foods, or herbal supplements used to assist initiation, maintenance or augmentation of breast milk production. Currently, the Academy of Breastfeeding medicine does not have recommended doses or preparations for the use of herbs as galactogogues[11]. The composition of most herbal or dietary supplements are unknown and may contain toxic substances. In Thailand, there are traditional foods, such as hot basil, lemon basil, sweet basil, banana blossom, garlic, garlic chives, ginger and pepper, used as galactogogues. The traditional use suggests safety and some efficacy of these foods.

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Concomitant with galactogogue food, evaluation and correction of any modifiable factors such as frequency and thoroughness of breast emptying have to be done. The objective of the present study is to evaluate the efficacy of hospital-based food program as galactogogues in the initiation period of lactation among Thai women.

Material and Method

A Quasi-experimental design was used to compare the breast symptoms and infants' body weight between two cohorts. Women who had a normal delivery of a healthy singleton infant with birth weight between 2,500-4,000 grams, during January and August 2012 at Thammasat Hospital were enrolled to our study. Women with serious medical condition affecting lactation or receiving medication that was contraindicated for breastfeeding, whose infant was admitted to the Neonatal Intensive Care Unit or had an illness affecting breast feeding were excluded. The study protocol was approved by the Human Subjects Review Committee, Thammasat University, Thailand.

Subjects were divided into two groups by a monthly admission. The study group received galactogogue foods composed of hot basil, lemon basil, sweet basil, banana blossom, garlic, garlic chives, ginger and pepper, as hospital-based food program. The control group had a healthy diet with the same amount of calorie and protein provided, i.e. 2,500 Kcal and 70 grams of protein per day, as recommended for lactating women. Subjects were asked not to take either additional foods or galactogogue medication. All women were attended in the breastfeeding promotion program of Thammasat Hospital, consisted of early initiation of breastfeeding, rooming-in and breastfeeding assistance during hospitalization.

After giving informed consent, data were collected from medical records consisting gestational age, gravid, parity, weight gain during pregnancy, duration of 2nd stage of labor, mode of delivery, labor medications, presence of meconium in amniotic fluid, infant's birth weight and Apgar score. Mothers were interviewed and evaluated daily from the 1st day of postpartum through their discharge date regarding timing of first breastfeeding, nursing frequency, LATCH score, non-breast-milk fluid, breast fullness/ hardness, leakage of colostrum/breast milk, letdown reflex and amount of food intake. Daily monitoring of infants' body weight was also recorded. Excessive weight loss was defined as weight loss greater than 7% from infant's birth weight.

Baseline characteristics and variables between the two groups were compared by Chi-squared tests for categorical variables and Student's t-test for continuous variables. Non-parametric test was used to compare non-normally distributed variables. The p-value <0.05 was considered of statistical significance.

Results

A total of 106 and 127 mothers-infants paired were enrolled as the galactogogue program and control group, respectively. Baseline characteristics between the two groups, including maternal age; pre-pregnant body mass index (BMI); parity; weight gain during pregnancy; duration of 2nd stage of labor; labor medications; presence of meconium in amniotic fluid; infant's birth weight and Apgar score, were not statistically significant different (Table 1).

Maternal report of breast fullness/heaviness within the first 48 hours in galactogogue group was significantly more than control. The presence of let-down reflex regarding to maternal report was not different between both groups. The median percentage of weight reduction within the first 48 hours in galactogogue group was significantly lower than controls [5.3 (IQR: 3.9-6.8) and 6.2 (IQR: 4.4-7.1) percent, respectively; $p = 0.041$]. Proportion of infant who had an excessive weight loss was also significantly lower in galactogogue group as compared to controls (Table 2).

There was no difference between both groups in number of infant who had early breast-fed and LATCH score. Breastfeeding frequency in 24 hours was not significantly different (8±2.5 and 8±2.1 times in galactogogue and control group, respectively; $p = 0.902$). There were no significant differences in the median volume of formula intake between both groups during the first 24 hours [0 (IQR: 0-30) and 0 (IQR: 0-30) ml; $p = 0.987$)] and during the next day [0 (IQR: 0-30) and 0 (IQR: 0-20) ml; $p = 0.198$)].

The evaluation of food intake revealed that women in galactogogue group was more frequent to take all/almost all of food served as compared to controls (75.8% and 63.3%, respectively; $p = 0.032$).

Discussion

The present study demonstrated the efficacy of hospital-based food program in the initiation of breastfeeding as evaluated by presence of breast fullness and reduction of infant's weight loss. Breast fullness has been demonstrated to correlate with milk volume and is one of the best choices for studies in

which test-weighing or breast pumping are not feasible[6,8]. Presence of breast fullness/heaviness is widely used to identify the onset of lactation. Maternal report of onset of lactation could also be imply as a valid clinical indicator of lactogenesis stage II[12]. Infants born to women with delay onset of lactation (>72 hour) had greater risk of excessive weight loss[8].

Women in galactogogue group reported breast fullness/heaviness within the 48 hours more frequent than women in the regular food program. Earlier onset of lactation, therefore, results in lesser weight reduction and lower incidence of excessive weight loss in galactogogue group as compared to controls.

Many studies have demonstrated the importance of early initiation, frequent breastfeeding and non-breast-milk fluid avoidance for successful lactation in early period[9,13]. The present study demonstrated no differences between either group in the breastfeeding frequency, timing of first breastfeeding and volume of formula feeding. All women in both groups also attended in the same breastfeeding promotion program. However, food intakes of women in galactogogue group were more frequent to meet caloric and protein requirements of lactating women as compared to controls.

Infant's weight measurement is widely used to assess breastfeeding adequacy. Prevalence of excessive weight loss varies due to inconsistent definitions. A systematic review demonstrated that weight loss more than 7% is excessive and needs further assessment and possible interventions[14]. Previous studies reported that excessive weight loss occurs 8-12% of breast-fed infants within the first week[8,10]. The authors defined excessive weight loss as weight loss more than 7% within 48 hours after birth. In our present study, the prevalence of excess weight loss was 21.5% that seems to be higher than previous reports. The possible reasons were different

Table 1. Baseline characteristics

Characteristics	Galactogogue group (n = 106)	Control group (n = 127)	*p*-value
Maternal age (year)[a]	26.8±6.4	27.8±6.6	0.273
Pregnancy weight gain (kg)[a]	14.6±5.9	14.3±5.4	0.705
Pre-pregnant BMI (kg/m^2)[a]	21.4±3.8	20.8±3.5	0.289
Breastfeeding plan (month)[b]	5 (3, 6)	6 (3, 6)	0.744
Educated higher than bachelor degree, No. (%)	3 (2.8)	9 (7.1)	0.085
Maternal use of analgesia, No. (%)	5 (4.7)	4 (3.2)	0.737
Meconium-stained amniotic fluid, No. (%)	8 (7.5)	5 (3.9)	0.263
Second stage of labor (min)[b]	13 (8, 26)	12 (7, 20.5)	0.302
Number of the child[a]	1.8±0.9	1.8±0.8	0.918
Birth weight of infant (g)[a]	3,144±416	3,135±340	0.858
APGAR, 1 min[a]	9.0±0.3	9.0±0.2	0.495

[a] Mean ± SD
[b] Median (interquartile change)

Table 2. Breastfeeding-related parameters and infant weight loss

Characteristics	Galactogogue group (n = 106)		Control group (n = 127)		*p*-value
	Cases	%	Cases	%	
Breastfeeding within 1 hour	93	87.7	115	90.6	0.261
Maternal report within 48 hours of					
Presence of breast fullness	76	71.7	72	56.7	<0.001
Presence of let down reflex	29	27.4	30	23.6	0.122
Infants with excess weight loss					
At age 24 hours	0	0	7	5.5	0.012
At age 48 hours	16	15.1	31	24.4	0.043

definition, in terms of cut-off value, measuring date and time, and different in climates that may have the effect on the hydration status.

The traditional use of some foods as galactogogue suggests possible efficacy of these foods. The authors demonstrated the galactogogue effect of foods as hospital-based program in initiating period of lactation. The mechanism in promoting lactation of individual substance was not established. One of the possible mechanisms, as shown from our data, is that hot and spicy foods may increase appetite and maternal caloric intake and/or increase water intake, thus resulting in increased breast milk production. Nevertheless, primary recommendations to intervene with insufficient milk production are proper evaluation and education regarding frequency of breastfeeding, breastfeeding techniques and emptying of both breasts, as well as treating the underlying causes.

Conclusion

The present study demonstrated the galactogogue effect of hospital-based food program in an early period of lactation, regarding presence of breast fullness and reduction of infant weight loss. Currently, the Academy of Breastfeeding Medicine does not have recommendations for the use of herbs as galactogogues due to insufficient data. Foods are safest because they are taken in normal amounts and rarely cause adverse effects. However, frequent breastfeeding with proper technique and emptying of breasts still are the most importance issues in initiating and maintaining lactation.

What is already known on this topic?

Despite many published data reporting in the use of medications and herbal supplements as galactogogue during initiation or maintenance period of lactation, the efficacy of galactogogue foods, there is lack of supporting data. Currently, the Academy of Breastfeeding Medicine does not have recommended doses or preparations for the use of herbs or foods as galactogogues. The traditional use suggests safety and some efficacy of these foods. Some hospitals have the galactogogue food programs for lactating women without any established result.

What this study adds?

The present study reports the efficacy of galactogogue food as hospital-based food program to promote breast milk production in initiation period of lactation, concomitants with early initiation of breastfeeding, rooming-in and breastfeeding assistance during hospitalization in regular breastfeeding promotion programs at Thammasat Hospital.

Acknowledgement

The present study was supported by Thammasat Research Grant, Thammasat University. The authors would like to thank Ms. Benjapun Burawat, Division of Nutrition and Food Service, Thammasat Hospital. Thanks are also extended to the nurses and house staff of the Department of Pediatrics and Obstetrics and Gynecology, Faculty of Medicine, Thammasat University for their generous helps and supports.

Potential conflicts of interest

None.

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ผลของการใช้อาหารกระตุ้นน้ำนมในโรงพยาบาลต่อการเลี้ยงลูกด้วยนมแม่ในระยะแรก

พัชราภา ทวีกุล, ยุทธเดช ทวีกุล, ภาสกร ศรีทิพย์สุโข

วัตถุประสงค์: *อาหารกระตุ้นน้ำนมสำหรับมารดาหลังคลอดเป็นที่ใช้กันอย่างแพร่หลาย เชื่อว่าสามารถเพิ่มการหลั่งน้ำนมได้ โดยที่ไม่มีข้อมูลสนับสนุนชัดเจน การศึกษานี้จัดทำขึ้นเพื่อศึกษาถึงประสิทธิภาพของการนำอาหารกระตุ้นน้ำนม เป็นเมนูอาหารสำหรับมารดา หลังคลอดในโรงพยาบาลที่มีผลต่อน้ำนมของมารดาในระยะแรก ซึ่งวัดจากเวลาที่มารดาเริ่มมีน้ำนมและการลดลงของน้ำหนักตัวทารกหลังเกิด*

วัสดุและวิธีการ: *มารดาหลังคลอดจำนวน 233 ราย ถูกแบ่งเป็นกลุ่มที่ได้รับอาหารกระตุ้นน้ำนม 106 ราย และกลุ่มควบคุม 127 ราย ประเมินผลของอาหารกระตุ้นน้ำนมโดยเปรียบเทียบข้อมูลต่าง ๆ ได้แก่ เวลาที่ทารกดูดนมแม่เป็นครั้งแรก ความถี่ในการให้นม การให้นมผสมหรือน้ำแทนนมแม่ อาการตึงคัดเต้านม เวลาที่มารดาเริ่มมีน้ำนมไหล และน้ำหนักตัวของทารก โดยเก็บข้อมูลทุกวันตั้งแต่วันแรกหลังคลอดจนถึงวันจำหน่ายจากโรงพยาบาล*

ผลการศึกษา: *มารดาที่ได้รับอาหารกระตุ้นน้ำนมมีอาการตึงคัดเต้านมภายใน 48 ชั่วโมงแรกหลังคลอดมากกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ (ร้อยละ 71.7 และ 56.7 ตามลำดับ โดยมีค่า $p<0.001$) นอกจากนี้ทารกที่มีน้ำหนักตัวลดลงอย่างมาก (เกินกว่าร้อยละ 7 จากน้ำหนักตัวแรกเกิดภายใน 48 ชั่วโมงแรก) ในกลุ่มทดลองมีจำนวนน้อยกว่าทารกในกลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ (ร้อยละ 15.1 และ 24.4 ตามลำดับ โดยมีค่า $p = 0.043$)*

สรุป: *การใช้อาหารกระตุ้นน้ำนมสำหรับมารดาหลังคลอดในโรงพยาบาลมีผลดีต่อน้ำนมของมารดาในระยะแรก โดยพบว่ามารดามีอาการตึงคัดเต้านมบ่อยกว่า และน้ำหนักตัวของทารกลดลงน้อยกว่ากลุ่มที่ได้รับอาหารธรรมดา สำหรับผลต่อน้ำนมมารดาในระยะยาวยังต้องทำการศึกษาต่อไป อย่างไรก็ตามการให้ทารกดูดนมบ่อย ถูกวิธี และดูดเกลี้ยงเต้า เป็นปัจจัยหลักที่ทำให้มีการสร้างน้ำนมมารดาอย่างเพียงพอ และควรได้รับการประเมินในหญิงให้นมบุตรทุกราย*