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ORIGINAL ARTICLE

The Effect of Fenugreek Herbal Tea and Palm Dates on Breast Milk Production and Infant Weight

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Abstract:

Background: Artificial or natural substances called galactagogues may assist the production of breast milk. Objective: To evaluate the effect of consumption of fenugreek herbal tea or palm dates on breast milk production. Methods: Seventy-five puerperal women were randomly assigned for two weeks to one of three groups: herbal tea with fenugreek (n = 25), palm dates (n = 25) or no galactagogue as control (n = 25). Maternal milk volume was measured through manual pumping of breasts on the third postpartum day. Infants were weighed on days (0, 3, 7, &14) using an infant scale. Results: Breast milk volume at 3 days postpartum and percentage weight change were statistically significant either dates or fenugreek groups and control group p<0.001, p=0.001 respectively. On the seventh day, newborns in date's group showed an increase in weight while those in fenugreek or control groups were still below their birth weight (p=0.001). On the fourteenth day, there was no significant difference between any of the groups (p=0.156). Conclusion: Palm dates and fenugreek herbal tea seems to be useful for enhancing breast milk production during early postpartum period.

Keywords: *Fenugreek- palm dates- Breast milk-galactogogues*

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Introduction

Knowledge of the biology of human milk and the physiology of its production, secretion, and delivery is critical in deeply understanding the benefits of breastfeeding. Human breast milk is the optimal nutrition for infants because of its proven advantages for both the infant, and the mother. The World Health Organization (WHO), the American Academy of Pediatrics (AAP), and the American College of Obstetricians and Gynecologists (ACOG) all recommend breastfeeding for the first six months of age [1]. Breastfeeding is exceptionally superior, giving mothers and infants distinct and substantial physical, mental, and developmental health advantages [2].

Poor breast milk production is the most frequent cause of breastfeeding failure. Reduced breast milk production may occur in many conditions, such as pre-term birth, illness of the mother or child, mother-infant separation, anxiety and emotional stress. All these circumstances act as powerful inhibitors of breastfeeding. Milk production can be increased in several ways, such as; psychological support and relaxation techniques [1]. Nonetheless, many mothers seek guidance from their physicians by asking for medical products to increase their breast milk supply, and galactagogues are often highly recommended.

Galactagogues are pharmaceutical agents, foods, or herbal supplements that are used to support the initiation, continuation, or augmentation of breast milk production [3]; hence they are often prescribed when a mother has an inadequate milk supply. Usually these prescribed galactagogues are artificially made drugs, which may contain substances that cause unpleasant side effects. For example, Metoclopramide (commercially known as Reglan®) is one of the most commonly prescribed drugs for increasing milk supply. However, its side

effects include severe depression and seizures [4]. Consequently, drug-licensing agencies take caution when allowing for these drugs to be administered.

In the Middle East, natural products such as fenugreek and palm dates often replace artificial drugs as they have one of the most widespread anecdotal benefits of increasing milk supply. Fenugreek has established itself as the most used natural galactagogue in the Middle East [1] due to its high anecdotal and cultural spread. However, some puerperal mothers occasionally consume palm dates as a supplement to increase their breast milk.

The date palm is one of the mankind's oldest cultivated plants. It has been used as food for 6000years [5]. It could be used for generations to come due to its remarkable nutritional, health and economic value. Dates offer potential for fighting hunger and diseases [6].

Date flesh is found to be low in fat and protein but rich in sugars, mainly fructose and glucose. It is a high source of energy, as 100 g of flesh can provide an average of 314 kcal. Ten minerals were reported. The major minerals were selenium, copper, potassium, and magnesium. The consumption of 100g of dates can provide over 15% of the recommended daily allowance from these minerals. Vitamins B-complex and C are the major vitamins in dates. Also it is high in dietary fibers [7].

Palm fruit has high content of phytonutrients with antioxidant properties. So there is possibility that palm fruit offers some health advantages by reducing lipid oxidation, oxidative stress and free radical damage [8].

Due to risks present upon taking artificial galactagogues, many puerperal mothers prefer using natural galactagogues to help increase their milk supply. However, the disadvantage of these natural products is that minimal scientific research has been conducted to evaluate their effectiveness as galactagogues. This leaves many mothers depending on cultural 'remedies', which may lead to the use of unbeneficial or harmful products. Therefore, it is essential to investigate the effects of these natural products when they are being used as galactagogues.
The most accurate assessment of the adequacy of breastfeeding is through direct measurement of the mother's breast milk volume when extracted through a pump. Another method that allows observation of a mother's increased milk supply is in observing successive measurement of the infant's naked weight. Nearly all infants lose weight for the first two to four days after birth [2-9] However, infants who are provided proper nutrition should not continue to lose weight after lactogenesis II as breast milk volume increases [9].

The aim of this study was to assess the effects of palm dates, and fenugreek on breast milk production and weight gain recovery of infants within the first two postpartum weeks.

Materials and Methods

A search was conducted for literature through PubMed, Embase and EBSCO search terms such as "breast-feeding", "lactation", and "galactagogue". Using the same database, the search was then specifically narrowed to herbs by name, such as "fenugreek", and to the desired fruit by name "palm dates". Only two researches were associated with fenugreek, while no researches or documents were found associating palm dates as galactagogues.

This study is a randomized controlled trial conducted at Ain Shams University Maternity Hospital, Cairo, Egypt. For allocation of the participants, we used a random number table and sealed opaque envelops [10]. Mothers were provided with full breastfeeding consultation including management of breastfeeding problems and newborn care. The Egyptian Research Ethical Committee at Ain Shams University Medical School approved this study. Informed consents were taken from mothers for approval of inclusion in the study.

Seventy-five mothers delivered vaginally at Ain Shams University Maternity Hospital were recruited. They were included if they were willing to breastfeed and pump their breasts for the study period. This was from April 2012 to November 2012.

Exclusion criteria for the mothers: Mothers were excluded from the investigation if any of the following descriptions were present: 1- High-risk pregnancy as diabetes or hypertension. 2- Inverted nipple . 3- History of asthma or allergy to peanuts. (Fenugreek is related to peanuts). Exclusion criteria for the newborns: Newborns were excluded from the investigation if they met any of the following standards: 1-Cleft lip or palate. 2- Gross congenital malformations or genetic syndromes.

Table 1. Comparison of selected baseline data of the study groups.

	Groups						F ratio	P
	Fenugreek		Dates		Control			
	Mean	SD (σ)	Mean	SD (σ)	Mean	SD (σ)		
Birth weight (grams)	3335.4	431.5	3419.6	447.12	3484.4	436.8	0.726	0.488
Gestational Age (weeks)	39.2	0.66	39.2	0.85	37.6	7.69	1.053	0.354
Maternal Age (years)	26.2	4.37	24.8	3.99	25.2	5.15	0.664	0.518

Table 2. Comparison of infant gender and maternal parity of the study groups.

		Groups						χ^2	P
		Fenugreek		Dates		Control			
		No.	%	No.	%	No.	%		
Infant Gender	Female	13	52.0	13	52.0	12	48.0	0.107	0.948
	Male	12	48.0	12	48.0	13	52.0		
Parity	Multiparity	13	52.0	11	44.0	12	48.0	0.321	0.852
	Primiparity	12	48.0	14	56.0	13	52.0		

3- Preterm or low birth weight. Exclusion criteria for the mother-infant pair: 'Mother-infant' pairs were disqualified and removed from the study when one of these conditions was met: 1-No compliance of the recommended dose of dates or fenugreek herbal tea. 2- Mixed feeding of the infant, other than breast milk directly from the breasts. 3- If the infant develops any illness that necessitates the intake of anything other than breast milk, (such as medications.)

Mother-infant pairs were randomly assigned into 3 groups. Group I (n=25) consisted of mothers who received fenugreek herbal tea, one cup three times daily. For each cup, 2 tablespoons of grade 'A' fenugreek, (approximately 2 grams were used).

Group II (n=25) consisted of mothers who consumed 10 palm dates flesh grade A 3 times daily. Each 10 palm dates' flesh weighed approximately 100 grams.

Group III (n=25) consisted of mothers who consumed no galactagogues. The investigation started on the first day postpartum. Infant weights were measured using a sensitive digital scale (Salter®) at birth and days, 3, 7 and 14.

Mothers were asked to pump both breasts before the first feed in the morning of the third day, using the same brand manual breast pump and measure the pumped milk volumes using infant bottles. These were later collected and measured with a graduated cylinder.

Statistical Methods

Quantitative data were presented as standard deviation and mean. One-way ANOVA was used to compare means of the groups. If significant difference was detected, the Post-Hoc pairwise comparisons between the three groups using the Bonferroni method [11] were employed. Qualitative data were presented as proportion and Chi square test was used to test the significance.

Results

Mean weight for newborns in grams was 3335.4 ± 43. There was no significant difference between groups, p=0.44. There was no significant difference between the three groups in gestational age and age of the mothers, p=0.35 and 0.52 respectively (Table 1). There was no significant differences between gender of the newborns and parity of the mothers in

Table 3. Comparison of the change in weight as a percentage from the birth-weight and the amount of breast-milk at the three different time-points in the study groups.

	Groups						F ratio	p
	Fenugreek		Dates		Control			
	Mean	SD	Mean	SD	Mean	SD		
Percent change of weight after 3 days	-5.5	0.9	-6.5	5.1	-9.3	2.9	8.404	0.001
Percent change in weight after 7 days	-0.5	5.1	2.9	4.5	-3.3	5.2	10.055	<0.001
Percent change in weight after 14 days	4.0	2.3	2.9	6.2	-1.9	18.4	1.903	0.156
Breast Milk volume (ml)	50.8	18.8	67.6	18.8	35.5	7.0	25.592	<0.001

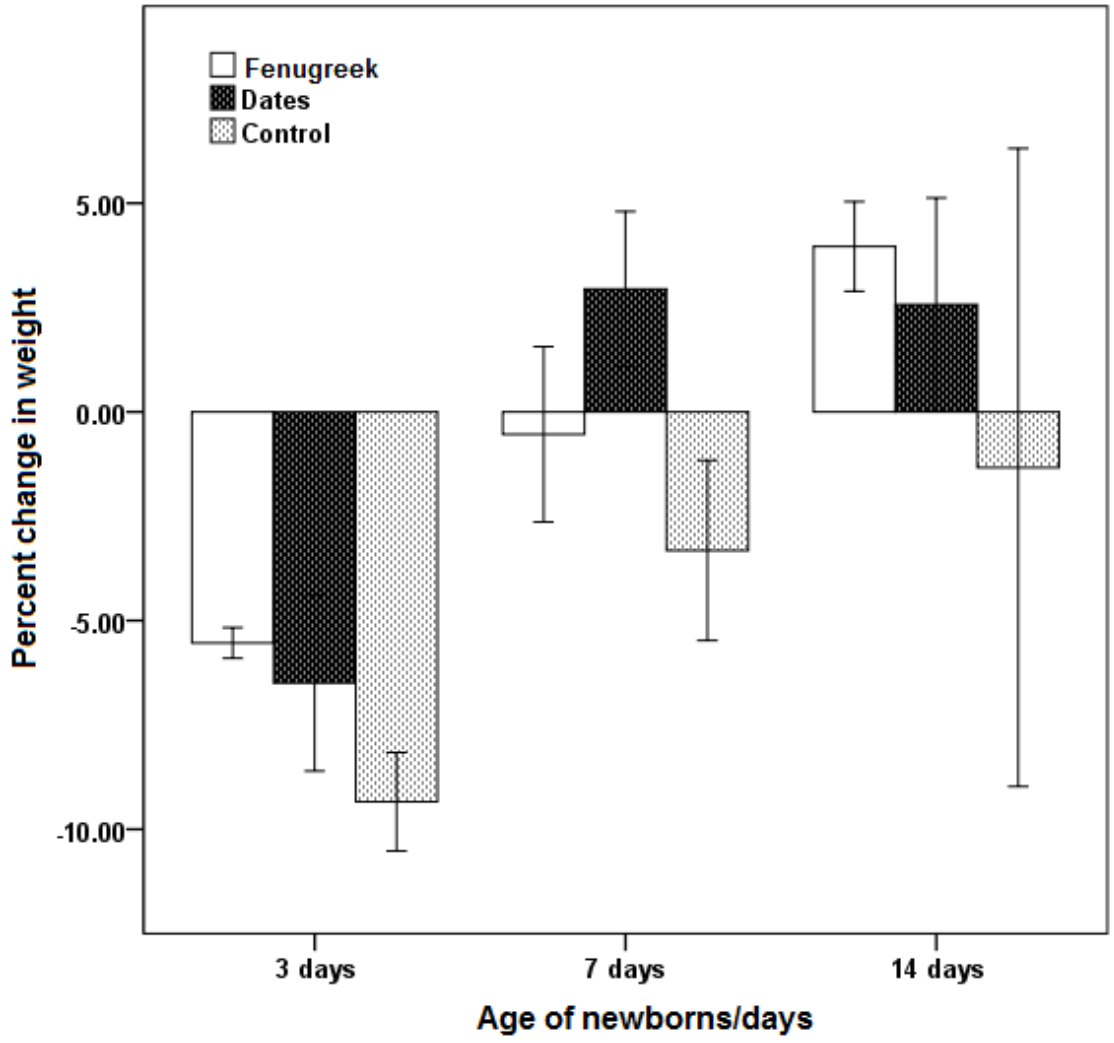

Figure 1. Percent change in infants weight in the three groups at the three time points

the study groups, p=0.95, 0.85 respectively (Table 2). Although there was a drop of the weight after three days in all groups, this drop was higher in the control group (9.3%±2.9%) when compared to fenugreek (5.5%±0.9%) and dates groups (6.5%±5.1%) (Table 3). These differences were statistically significant

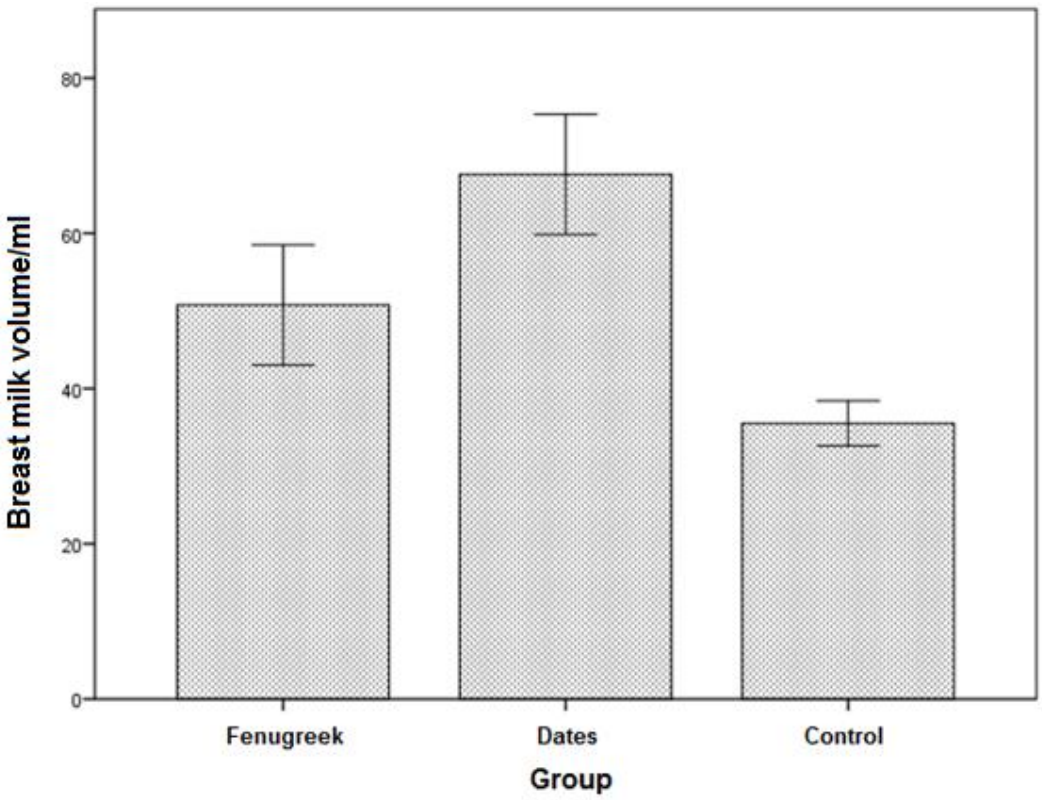

Figure 2. Breast milk volume in the three groups on the third day postpartum

between the control group and either intervention group, p=0.001. On the 7th postpartum day, the percentage weight of the babies on the average was still below the birth weight in both the control and fenugreek groups, while that of the dates group showed a remarkable increase of (2.9%±4.5%), which was statistically significant when compared to the other two groups, p<0.001 (Figure 1).

However, on the 14th postpartum day, there was no statistically significant difference between the three groups in the percent weight change when ANOVA was used, P=0.16. However, using the non-parametric Kruskal-Wallis Test [12] the results yielded a significant difference ($\chi 2$ =19.929 and p<0.001) in favor of each of the intervention groups. Breast milk volume at third day postpartum was more in dates and fenugreek as compared with the control group, p <0.001 (Figure 2).

Discussion

In spite of the wide use of herbal galactagogues, there are limited data on their safety and efficacy [13]. In many studies, postnatal weight loss and age on regaining birth weight are two frequently used clinical parameters for monitoring an infant's feeding status in the first few weeks of birth [14]. Moreover, the American Academy of Pediatrics recommends that every infant is to be weighed between the third and fifth days postpartum [2]. Macdonald's et al, [15] conducted a study on weight change pattern in newly born infants. They found that among exclusively breastfed infants, the median weight loss was 6.6 of birth weight, and the median time to regain birth weight is 8.3 days. Once lactogenesis II is completed, an infant who is nursing effectively should obtain enough milk to begin gaining weight.

This occurs by day 4 or 5 at a rate of approximately 15 to 30 grams per day. At this rate, most breastfed infants exceed their initial birth weight by the first 12-14 days postpartum [16]. Thus, we chose the following time period to weigh the infants after birth: 3, 7, and 14 days. The American Academy of Pediatrics (AAP) defines weight loss of up to 7% of birth weight in the first 3 to 5 days of life as acceptable for the breastfeeding infant. Weight loss of greater than 7% should trigger evaluation for breastfeeding problems. This applies to all

breastfeeding infants regardless mode of delivery [17].

While Preer et al, [18] that absence of pain prior to cesarean birth is a risk factor for greater than expected weight loss in exclusively breastfed infants by Cesarean birth in a baby- friendly hospital.

In this study; the percent change of weight from the initial birth weight showed a significant difference, $p=0.001$ after 3 days, and <0.001 after the first week postpartum. There was no significant difference by the second week postpartum, $p=0.16$.

This can be explained by the nature of these natural galactagogues as they only accelerate the transition form Lactogenesis I to Lactogenesis II. The volume of breast milk showed a statistically significant difference between the three groups. The control group showed the lowest amount. There was no significant difference between Fenugreek and dates. This shows that fenugreek and dates increased breast milk volume significantly by the third day postpartum.

Our results are in agreement with the results of Turkyilmaz et al, [14] They studied the effect of herbal tea galactagogue containing fenugreek on breast milk production within the first two weeks postpartum [14]. Sixty-six women were randomly assigned to receive tea with fenugreek, a placebo in the form of apple tea, or no supplement as a control. Fenugreek group had almost double the mean volume of pumped milk (73 mL) as compared to the placebo (39 mL) and the control (31 mL). The fenugreek galactagogue infants had also a lower weight loss and a shorter time of recovery of birth weight. The authors concluded that the galactagogue herbal tea positively supported lactation in early postnatal period. However, the herbal tea used was not pure fenugreek. It contained fennel, raspberry leaves which sometimes are used as galactagogues. Fenugreek used in our study was pure fenugreek seeds, boiled to make the herbal tea. Another report summarized the anecdotal account of approximately 1200 women over 6 years. They were supplemented with commercially available fenugreek under the direction of a nurse. It was reported that women experienced an increase in milk supply within 24 hours of use [3].

Our investigation confirmed what was previously investigated about fenugreek that it effectively functions as a galactagogue. Furthermore, palm dates may now be introduced as a galactagogue for providing a significant increase in breast milk secretion for the early postpartum days. Their impact was indirectly observed on the volume of breast milk on the third day post partum and infants' weight. This could be explained by their role in accelerating the shift to Lactogenesis II to begin earlier than it would normally occur naturally. Thus producing more breast milk volume until prolactin levels initiate galactopoiesis.

There were limitations to this investigation. Providing a placebo would have benefitted this investigation, as it would be essential to identify if the galactagogue effect was independent of the placebo effect. Moreover, the methodology of the investigation lacked breast milk volume assessment beyond the third postpartum day. Measurement of breast milk volumes along with infants weight after the third day would have allowed more accurate representation of the effectiveness of fenugreek and dates as galactagogues.

This causes a question to arise, concerning if these natural galactagogues might be used later on during breastfeeding. In addition, the mechanism that allows these natural galactagogues to stimulate the earlier secretion of breast milk is essential to investigate. Nevertheless, fenugreek and palm dates have been evaluated for effectively functioning as galactagogues for the early postpartum period. This investigation suggests that fenugreek and dates are effective galactagogues when used to increase milk supply in early postpartum, approximately for about the first two weeks.

Conclusion

Fenugreek herbal tea and palm dates supplementation appear to be useful for promoting and increasing breast milk production in the early postpartum days. As confirmed by the results, this investigation supports the formulated hypothesis that fenugreek and palm dates are effective natural galactagogues. Their effect was evident during the first two weeks post partum.

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