

Effect of acupressure on milk volume of breastfeeding mothers referring to selected health care centers in Tehran

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ABSTRACT

Background: Breast milk is the main food source for infants' growth and development. Insufficient milk is one of the obstacles to the adequate use of this substance. One of the treatments to help this issue is acupressure. Therefore, the present study was designed to determine the effect of acupressure on maternal milk volume.

Materials and Methods: This study is a randomized clinical trial in which 60 breastfeeding mothers complaining of hypogalactia and meeting the inclusion criteria were studied. In addition to providing routine education, bilateral acupressure was performed for 12 consecutive days on the acupoints of SI1, LI4, and GB21 in the intervention group, as three sessions per week with each session conducted 2-5 times. The control group received only routine education. In both groups, breast milk volume before intervention and 2 and 4 weeks after intervention was evaluated by an electric pump. Data were analyzed by descriptive and inferential statistical analysis through SPSS.

Results: The *t*-test showed no significant difference in the mean volume of milk in the two groups ($P = 0.543$). Mean volumes of milk before and 2 and 4 weeks after the intervention were 10.5 (8.3), 33 (13.44), and 36.2 (12.8), respectively, in the acupressure group and 9.5 (7.7), 17.7 (9.4), 18 (9.5), respectively, in the control group. Analysis of variance (ANOVA) test showed a significant difference in the mean volume of milk at 2 and 4 weeks after the intervention ($P < 0.001$).

Conclusions: Both acupressure and general education methods were effective on the milk volume of breastfeeding mothers. Acupressure method was more effective than the other method. Therefore, application of acupressure as a method of alternative medicine to increase breastfeeding is suggested.

Key words: Acupressure therapy, breastfeeding, mothers, volume of milk

INTRODUCTION

Mother's milk plays an important role in newborn's growth and development, and even in adulthood. The benefits of breastfeeding are numerous both for the mothers and their infants. For instance, breastfeeding is associated with lower incidence of breast cancer before menopause, ovarian cancer, type 2 diabetes, MI, and metabolic syndrome in mothers. The advantages of breastfeeding are a reduction in incidence of diseases such

as respiratory and gastrointestinal diseases and a positive effect on IQ for the infants, a lower economic burden for the family, etc.^[1-4] Promotion of breastfeeding is one among the goals of World Health Organization (WHO).^[4] Many methods have been followed to achieve this goal such as establishment of children-friendly hospitals and conducting breastfeeding education for the mothers.^[5,6] Despite all the conducted activities, a high number of mothers feed their infants with formulas due to their inadequacy of breast milk, although they like to breastfeed.^[7,8] The reports from some countries revealed the inadequacy of mother's milk to be 22%.^[4]

Production of milk is a process including numerous factors such as mother's nutrition, as well as environmental, biological, physiological, economic, and social elements.^[9] Marandi reported that one of the effective factors in failure of breastfeeding is mother's inadequate milk.^[10] Various treatments have been applied to increase mother's milk, including medicational and non-medicational methods. Metoclopramide, carbamazepine, and domperidone are among the efficient medicational methods for breastfeeding,

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which also have some side effects.^[11] Among the non-medical methods is complementary medicine including acupuncture and acupressure.

Acupressure is a type of Chinese traditional medicine which is based on putting pressure on specific acupoints in the body that leads to balancing the energy in the body, but its mechanism on breastfeeding is unknown.^[12,13] Low cost, convenience of learning, and being noninvasive are among the advantages of acupressure.^[14] Although several studies have investigated the effect of acupuncture on breastfeeding, and there are studies on acupressure and cortex stimulation,^[15] nausea, vomiting, and anxiety,^[16] no study has been conducted on the relation between the effect of acupressure and mother's milk volume. Lixin *et al.*,^[3] in a study on the effect of acupuncture on mother's inadequate breastfeeding, showed that this method could increase the secretion of prolactin hormone, which increases mother's milk. Zhou *et al.*,^[17] in a study on the treatment of post-cesarean hypogalactia by auricular points sticking-pressing, showed that acupuncture was effective on mother's milk production. Among the acupoints effective on breastfeeding are AH10, CO18, CO13, CO12, and CO4.^[9]

With regard to the benefits of mother's milk and breastfeeding and their importance as one of the goals of WHO, as well as the need for conducting a study on the effect of acupressure on breastfeeding, the present study aimed to investigate the effect of acupressure on mother's milk volume.

MATERIALS AND METHODS

This is a random clinical trial conducted on 60 breastfeeding mothers who referred to selected health care centers in Tehran with the complaint of hypogalactia. It should be mentioned that the researchers paid close attention to ethical considerations during all the steps of the research. The subjects were randomly assigned to either study group or control group.

Randomization was conducted by random number table such that odd numbers were assigned to group A (acupressure group) and even numbers to group B (control). Firstly, numbers 1-60 (total number of subjects) were written on special cards and put in thick envelopes. Then, the subjects randomly drew an envelope on their arrival to the center and were assigned to either acupressure or control group according to the number written on the card in the envelope. The research environment included all health care centers in Tehran (capital of Iran), out of which eight centers, affiliated to Shahid Beheshti University, were selected by draw. Firstly, the goal of the study was explained to the mothers and those who were eligible for the study (meeting the inclusion criteria) were willing to join the study were

enrolled. Stages of study were explained to the mothers and a signed written consent form was obtained from them. Inclusion criteria were mothers of age 20-40 years, having inadequate breast milk, not receiving any treatment such as milk increase drop or domperidone, having had a single tone delivery recently, having intact skin of acupoint, no history of breast surgery effective on breastfeeding, no chronic cardiovascular diseases or renal diseases, and having delivered a term infant of weight 2500-4000 g. The subjects were excluded from the study if the infants had no appropriate weight gain, other milk increasing treatments were being used, the mother or infant was affected with a disease or problem that needed intervention, there was inappropriate administration of acupressure, and the mother was not interested to continue in the study.

In the first session, infants' weight and mothers' milk volume were measured, and if the mother's milk volume was less than 30 ml and she met other inclusion criteria, she was enrolled in the study. It should be noted that the volume of mother's milk was measured by an electric breast pump for 15 min, 1 h after her last breastfeeding, in the counseling room of the health care center, where she had enough privacy. The measurements of the weight and volume of milk were conducted between 8 and 11 AM by a questioner to respect the blindness of the study. This study was conducted on breastfeeding mothers who had hypogalactia from 10-15 days until 6 months post delivery. The acupoints used were GB20 (in a depression between the upper portion of the sternocleidomastoid muscle and the trapezius on the same level with GV16), acupoint LI4 (on the dorsum of the hand, between 1st and 2nd metacarpal bones), and acupoint SI1 (1 cun posterior to the corner of the nail on the upper side of the little finger).^[18] The mothers were educated to press the acupoints in both sides of the body three times a day, each time for 2-5 min, and for 12 sequential days. The level of pressure was so as to pail the nail of pressing thumb. It should be noted that the researcher learned how to locate and press the related acupoints correctly under the supervision of an acupressure expert during several sessions, and her administration of pressure was approved by him. Then, this technique was taught to mothers in the acupressure group in several sessions held every other day during the 12 days of intervention. The researcher supervised the mothers locating the acupoint and pressing that, and solved their problems. The mothers in the study group were given a photo showing the exact location of the three acupoints. Correct administration of the technique was checked through phone calls and by the researcher frequently visiting the mothers.

Data were collected by a questionnaire which was completed through an interview and the measurements made by the researcher. It included 20 questions. Face validity was used for checking the scientific validity of

the researcher-made question naire on personal fertility characteristics. It was such that the researcher made the primary draft of the questionnaire through consideration of related variables, texts, and articles in this context, as well as consultation with her supervisor and counselor. Then, the primary draft was reviewed by 10 academic members for its content quality and the final questionnaire was prepared with their modifications in it.

Infants' weight was measured using the RGZ-20 baby and children weighing scale by the researcher. Medulla (made in Swaziland) was the electric breast pump used to measure mothers' milk volume once before the intervention and then 2 and 4 weeks after the intervention by a questioner. Researcher learned the detection of acupoint and correct administration of pressure from an expert of acupressure medicine. As the mother visit days were already determined and each group (study and control) was evaluated on a separate day, there was no chance for the mothers in the control group to visit the mothers in the study group. Data were analyzed by one-way analysis of variance (ANOVA) and Kruskal–Wallis tests.

RESULTS

Seventy-two subjects attended the study of whom 12 (7 in the control group and 5 in the study group) were excluded due to a change in their residential area, 3 for administration of a wrong technique, 3 due to disease in mother, and 1 due to disease in infant. Finally, the data of 60 subjects were analyzed. Based on the obtained results, Chi-square and Kruskal-Wallis tests showed no significant difference in subjects' demographic characteristics (the subjects were homogenous). Mothers' mean age in the acupressure and control groups were 24.5 (3.70) and 24.2 (3.70) years, respectively. Most of the mothers were homemakers (90%), had high school diploma (50%), had rented a house (90%), and had cesarean section (83%). There was no significant difference in these variables in the two groups ($P > 0.05$).

Most of the infants were the first born in both groups (acupressure = 46.7% and control group = 53.5%). Male infants constituted 50% and 70% in the acupressure and control groups, respectively.

Kruskal–Wallis and Chi-square tests showed no significant difference in the rank and sex of the infants in the two groups. Mean weights of infants in the acupressure and control groups before intervention were 3550 (667.342) and 3534 (616.115) g, respectively. The *t*-test showed no significant difference in mothers' volume of milk before intervention ($P = 0.543$).

Mean volumes of milk of mothers before, 2 weeks after, and 4 weeks after the intervention were 10.5 (8.3), 33 (13.44), and 36.2 (12.8) ml, respectively, in the study group and 9.5 (7.7), 17.7 (9.4), and 18 (9.5) ml, respectively, in the control group. One-way ANOVA showed a significant difference in the mean milk volume of mothers 2 and 4 weeks after intervention ($P < 0.001$). Mean milk volume of mothers was more in the study group compared to the control group ($P < 0.001$) [Table 1].

DISCUSSION

The obtained results showed that acupressure led to an increase in mothers' milk volume among the mothers complaining of hypogalactia. Although mothers' milk volume also increased in the control group, where the subjects just received routine education of breastfeeding, the increase was more in the acupressure group. As the researcher found no study on the effect of acupressure on breastfeeding, the studies on the effect of acupressure on other issues and acupuncture on breastfeeding are discussed. Hejilmastati *et al.*, in a study on 70 pregnant women, could decrease the mean score of labor pain in the active phase of delivery through acupressure in India.^[19] Kashani *et al.* reported shortening of active delivery phase and a reduction in labor pain after acupressure. In addition, the dosage of oxytocin required in the study group was less than in the control group.^[20] Among other similar studies conducted on the effect of acupressure on delivery stages and pain are those of Akbarzadeh *et al.*,^[21] Lee MK,^[22] and Smith *et al.*^[23] Based on the results of these studies and the lesser need to prescribe oxytocin during labor, it can be concluded that as this hormone is one of the effective substances on successful breastfeeding, acupressure may be effective or its secretion and process of breastfeeding.

In the study of Johanks *et al.* on women with breast cancer, conducted after chemotherapy of the subjects, nausea, vomiting and anxiety of the women in the intervention group were reduced.^[15] Zick *et al.* reported reduction in cancer-related fatigue after acupressure.^[24] The effect of acupressure on improvement on physical and psychological menopausal signs was reported in the study of Anvarrizak.^[25] Zick, in a study on the effect of acupressure on cancer patients' fatigue, showed that even during the treatment period less than 12 weeks, acupressure was effective in reducing fatigue.^[26] As reduction of mother's anxiety and fatigue is among the factors influencing breastfeeding,^[27] it seems that the positive effects of acupressure in the present study on mothers' milk volume may be associated with this reduction after acupressure. Gao reported that acupressure was effective on acute mastitis, but not on breastfeeding.^[28] This is possibly due to the difference in their used acupoints (HT3, GB21, SP6), compared to the present

Table 1: Mean milk volume of mothers at different time points in two groups of acupressure and control before the intervention and 2 and 4 weeks after the intervention

Group	Before intervention		Two weeks after intervention		Four weeks after intervention		ANOVA	
	Mean	SD	Mean	SD	Mean	SD	F	P
Acupressure	10.5	8.3	33	13.44	36.2	12.8	70.00	<0.001
Control	9.5	7.7	17.7	9.4	18	9.5	11.648	<0.001
One-way ANOVA								
F	0.616		10.836		15.792		-	
P value	0.543		<0.001		<0.001		-	

One-way ANOVA showed no significant difference in mean milk volume of mothers before intervention in the two groups ($P=0.543$), but 2 and 4 weeks after intervention, there was a significant difference in the two groups ($P<0.001$). SD: Standard deviation

study. Liksin *et al.*, in a study on the effect of acupuncture on hypogalactia, showed that acupuncture significantly increased prolactin.^[3] In a study on the effect of electric acupuncture on auricular points, Zhou *et al.* found that it was effective on post CS breastfeeding defect and mothers' milk volume.^[17] Liksin's and Zhou's findings both revealed the positive effects of acupuncture on the level of prolactin and mothers' milk volume, which are consistent with the results of the present study. Prolactin is one of the basic hormones in the secretion of mother's milk and its increase promotes breastfeeding.^[29] Based on Chinese traditional medicine, stimulation of several points in the body can lead to a balance in blood circulation, hormone secretion, and other factors, which can improve predication and secretion of mother's milk. On the other hand, stimulation of some other points can increase prolactin and oxytocin and, consequently, lead to better breastfeeding.^[28,30,31]

Although the acupoints used in acupressure are the same as the points used in acupuncture, due to the noninvasive nature of acupressure, compared to acupuncture, it seems that application of acupressure to improve breastfeeding may be more effective on the mothers who disagree to undergo acupuncture. It seems necessary to conduct further studies to compare acupressure with other complementary therapies in relation to improvement of mothers' breastfeeding. Marsha *et al.*, in a study on the effect of domperidone on the composition of preterm human breast milk, showed a significant difference in mothers' milk volume after taking domperidone, compared to the control group.^[6] Jantarasengaram *et al.*, in a study aimed to investigate the effects of domperidone on augmentation of lactation following a full-term cesarean delivery, reported the positive effect of domperidone on improvement of lactation.^[32] Although domperidone leads to improved lactation through its effect on prolactin concentration in plasma, it has notable cardiac and dystonic reaction.^[33] On the other hand, some organizations have warned about the use of domperidone to increase milk production due to the serious side effects of this medication, including arrhythmia, acute ventricular arrhythmia, and sudden death.^[33-35]

Owing to its low cost, complication-free nature, and convenience of application,^[14] acupressure can be introduced instead of other methods to increase the milk production in mothers who complain of hypogalactia and whose infants are predisposed to be deprived of this healthy and nutrient food. As WHO recommends mothers to breastfeed their children up to 2 years,^[4] and the subjects in the present study were the breastfeeding mothers in their initial stages of lactation, further studies on the mothers breastfeeding children of higher ages are recommended.

CONCLUSION

It can be conducted that both acupressure and general education methods were effective on the milk volume of breastfeeding mothers. On the other hand acupressure method was more effective than the other method. So application of acupressure as a method of alternative medicine to increase breastfeeding is suggested

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