



Effect of rolling massage and ST-18 acupressure on breast milk production and decrease in fundal height

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ABSTRAK

Latar Belakang: Produksi dan sekresi ASI dipengaruhi oleh refleksi prolaktin dan refleksi let-down. Salah satu cara untuk meningkatkan produksi ASI adalah dengan rolling massage dan akupresur ST-18. Titik ST-18 (Ru Gen) terletak di sebelah lateral payudara, 4 jari di bawah puting susu, dan dapat meningkatkan sirkulasi darah yang dapat merangsang alveolus untuk berkontraksi sehingga ASI keluar menuju puting. Penelitian sebelumnya menyatakan bahwa ibu nifas yang diberikan senam nifas dan akupresur pada hari kedua, keempat, dan ketujuh setelah melahirkan sama-sama meningkatkan produksi ASI, namun kelompok akupresur lebih tinggi dibandingkan kelompok senam nifas.

Tujuan: Penelitian ini bertujuan untuk mengetahui pengaruh rolling massage dan akupresur ST-18 terhadap produksi ASI dan penurunan tinggi fundus pada ibu nifas.

Metode: Penelitian ini merupakan penelitian eksperimen semu. Rancangan penelitian ini adalah Randomized Control Group dengan Pre-Test dan Post-Test. Populasi dalam penelitian ini adalah seluruh ibu nifas di Puskesmas Kota Semarang yang berjumlah 16 responden pada kelompok perlakuan dan 16 responden pada kelompok kontrol, dikumpulkan secara cluster random sampling. Setelah mendapat persetujuan dari responden, peneliti mulai melakukan pre-test terhadap tinggi fundus dan produksi ASI pada kelompok perlakuan dan kelompok kontrol, kemudian post-test setelah 3 hari perlakuan. Data dianalisis dengan uji t Independen dan uji Mann Whitney.

Hasil: Karakteristik responden pada kedua kelompok menunjukkan sebagian besar responden berusia 27,9 tahun, merupakan wanita primipara dan memiliki status gizi baik. Rerata peningkatan produksi ASI dinilai dari pertambahan berat badan bayi sebelum dan sesudah perlakuan dari 3117,8 gram menjadi 3254 gram. Ada perbedaan produksi ASI pada kelompok perlakuan dan kontrol dengan nilai $p < 0,0001$, dan tidak ada perbedaan penurunan tinggi fundus pada kedua kelompok ($p \text{ value} = 3,91$), namun penurunan tinggi fundus pada kelompok perlakuan lebih cepat dibandingkan kelompok kontrol yaitu 3,91 cm.

Kesimpulan: Perlunya bidan memberikan asuhan kebidanan pada ibu nifas secara holistik dan komprehensif misalnya berupa rolling massage dan akupresur pada titik ST-18.

KATA KUNCI: pijat bergulir; akupresur; produksi air susu ibu; tinggi fundus uteri

ABSTRACT

Background: Breast milk production and secretion are affected by the prolactin reflex and let-down reflex. One of the methods to increase breast milk production is by rolling massage and ST-18 acupressure. ST-18 point (Ru Gen) is located lateral to the breast, 4 fingers below the nipple, and can increase blood circulation which can stimulate the alveolus to contract so that breast milk is secreted towards the nipple. A previous study stated that postpartum mothers were given puerperal exercise and acupressure on the second, fourth, and seventh days after giving birth both increased milk production, but the acupressure group was higher than the postpartum exercise group

Objectives: The purpose of this study was to determine the effect of rolling massage and ST-18 acupressure on breast milk production and fundal height decrease of postpartum women.

Methods: This study was an quasi experimental study. The study design was Randomized Control Group with Pre-Test and Post-Test. The population were all postpartum women in the Community Health Centers in Semarang who were assigned to 16 respondents in the treatment group and 16 respondents in the control group, collected by cluster random sampling. After obtaining consent from the respondents, the researchers began to make the pre-test on the fundal height and breast milk production in the treatment group and the control group, then post-test after 3 days of treatment. Data were analyzed by Independent t test and Mann Whitney test.

Results: Characteristics of respondents in both groups showed that most of respondents aged 27.9 years, were primiparous women and had good nutritional status. The mean of increase in breast milk production were assessed from infant weight gain before and after treatment from 3117.8 grams to 3254 grams. There was a difference in breast milk production in the treatment and control group with the p value of 0.0001, and there was no difference in the decrease in fundal height in the two groups (p value=3.91), however the decrease in fundal height in the treatment group was faster than the control group which was 3.91 cm.

Conclusions: The need for midwives to provide midwifery care to postpartum women in a holistic and comprehensive manner, for example in the form of rolling massage and acupressure on ST-18 point.

KEYWORD: rolling massage; acupressure; breast milk production; fundal height

Article Info :

Article submitted on April 23, 2022

Article revised on May 17, 2022

Article received on June 22 , 2022

DOI: [http://dx.doi.org/10.21927/jnki.2022.10\(2\).142-150](http://dx.doi.org/10.21927/jnki.2022.10(2).142-150)

INTRODUCTION

The percentage of exclusive breastfeeding among infants 0-6 months in Central Java in 2018 amounted to 65.6 percent, which was still below the target of 80%. Various efforts have been made/done through counseling since the pregnancy period, until the promotion of exclusive breastfeeding through various media(1). The coverage of exclusive breastfeeding in Semarang City in 2018 was 68.22%. This is still far from the target of Exclusive breastfeeding coverage in Semarang namely 80% (2). Longitudinal studies (Rosa, 2019) stated that mothers who had efficacy and perceptions of breast milk supply had less effect on the duration of exclusive breastfeeding for less than 6 months (3). A survey conducted on mothers after 3 weeks of delivery

found that 44% had a perception of insufficient breast milk and tended to give formula milk earlier by 66% (4).

Breast milk production and secretion are affected by the prolactin reflex and let-down reflex. Prolactin reflex is influenced by the suction of the baby which will stimulate the receptors on the nipples and breasts and then this stimulation is directed at sensory nerve endings to the hypothalamus through the spinal cord and mesencephalon to stimulate the adenohypophysis (anterior pituitary) to secrete prolactin and stimulate the alveoli to produce milk. Oxytocin reflex or let-down reflex comes from the baby's suction which is continued to neurohypophysis (posterior pituitary) which secretes oxytocin so that there is contraction myoepithelial cells of the alveolar walls and

mammary cells which then enter the ductile system and the breast milk will flow through the lactiferous ducts(5). The oxytocin reflex will increase muscle contraction in the uterus so that compresses blood vessels and accelerates the process of uterine involution. To ensure the involution process goes well, the uterine fundal height is measured from the symphysis direction (6).

There are various pharmacological or non-pharmacological efforts to increase breast milk production. Many types of massage can be done by swabs (massage) or suppression (acupressure) at certain points that can increase milk production. One massage that can be used to increase Breast milk production is rolling massage. Rolling massage is a massage on the spine (costae 5-6 to scapula with a circular motion) performed on women after childbirth which can help the work of the oxytocin hormone in breastfeeding, accelerate the parasympathetic nerve to deliver signals to the posterior part of the brain to stimulate the work of oxytocin in excreting the breast milk(7). Increased oxytocin will help the uterine involution process so that there is a decrease in fundal height(8) a leading cause of breastfeeding attrition. Complicating the understanding of oxytocin pathways is that vasopressin may interact with oxytocin receptors, yet little is known about the role of vasopressin in lactation. According to a study conducted by Yuliaty 2017, the combination of rolling massage and oketani massage was effective in increasing breast milk production among postpartum women (9).

Acupressure is a massage technique with stimulation method at certain meridian points to balance energy in the body(10). Previous study about investigated the effects of meridian acupressure massage on body composition, edema, stress, and fatigue in postpartum women. Design: A quasi-experimental design with a nonequivalent control group was utilized. Settings/location: The Postpartum Care Center of Women's Hospital in Gwangju City, Republic of Korea. Subjects: The study group consisted

of 39 postpartum women, 19 in the experimental group and 20 in the control group, recruited from the postpartum care center of Women's Hospital in Gwangju city, South Korea. Interventions: The experimental group was provided with meridian acupressure massage for 90 min daily over 5 days as an experimental therapy. Outcome measures: Body composition (body weight, BMI, total body water, ECW ratio, LBM, and body fat. There was a difference between the treatment and control groups (10). ST-18 point (Ru Gen) is located lateral to the breast, 4 fingers below the nipple, and can increase blood circulation which can stimulate the alveolus to contract so that breast milk is secreted towards the nipple A previous study stated that postpartum mothers were given puerperal exercise and acupressure on the second, fourth, and seventh days after giving birth both increased milk production, but the acupressure group was higher than the postpartum exercise group(12). A systematic review (Hajian, 2021) acupuncture and acupressure on acupuncture points GB21, LI4, SI1, ST17, and CV18 can increase breast milk volume. In addition, the combination of acupressure with relaxation or oxytocin massage can increase milk production. In another study, acupressure at points Gb21, Li4, and SI1 showed no significant difference with the control group (13). From several studies on acupressure, different results were obtained, so this study combines acupressure intervention with rolling massage to increase breast milk production. This study aims to determine the effect of rolling massage and ST-18 acupressure on breast milk production and fundal height decrease of postpartum women

MATERIALS AND METHODS

This study was quasi experimental study. The study design was Randomized Control Group with Pre-Test and Post-Test. The population were all postpartum women in the Community Health

Centers in Semarang who were assigned to 16 respondents in the treatment group and 16 respondents in the control group, collected by cluster random sampling. The research is done in August-October 2018. Independent variable in this research is rolling massage and ST-18 acupressure, and the dependent of this research is breast milk production and fundal height. The experimental group was given rolling massage and acupressure ST-18 with a rolling massage rotating starting the costae 5-6 until scapula followed by pressure using the finger (thumb segment) at the point area which is located lateral of breast 4 fingers under the nipple for 15 minutes. The control group was given according to service standard breast care. After obtaining consent from the respondents, the researchers began to make the first measurement (pre-test) on the fundal height and breast milk production in the treatment group and the control group, then repeated measurements (post-test) after 3 days of treatment. In this study, all respondents were pretested on the first postpartum day and the post-test was carried out on the fourth postpartum day. Breast milk production in value the amount of breast milk produced by both breasts every day is identified with the difference in infant BB before and after treatment, while the decrease in uterine fundus height is assessed from the uterine involution process measured from the symptom towards the uterine fundus in centimeters. Data were analyzed by Independent t test and Mann Whitney test.

RESULTS AND DISCUSSION

RESULTS

Characteristics of Respondents

Table 1 shows that in average, of the respondents in the treatment and control group was 20-35 years, the respondents were primiparous women 56.2% and had good nutritional status with the UAC of 23.5 cm. The nutritional status variable of the women

Table 1. Characteristics of respondents

Variable	Treatment		Control	
	F	%	F	%
Age				
20-35 years	16	100	16	100
>35 years	0	0	0	0
Paritas				
Primipara	9	56.2	7	56.2
Multipara	7	43.8	9	43.8
Nutritional status				
≥ 23.5 cm	16	100	16	100
< 23 cm	0	0	0	0

was assessed using the size of the upper arm circumference. In Hidajati (2012) the age of a mother greatly determined maternal health because it was closely related to the conditions of pregnancy, childbirth and postpartum, as well as how to care for her baby (14). Among primiparous women with the age of 35 years and over, the hormone production is relatively reduced, the lactation process decreases, whereas in adolescence (12-19 years) it must also be studied carefully because the physical, psychological, and social developments are not ready so that they can disrupt psychological balance and can affect the production of breast milk. Women who have had good breastfeeding experience will try their best to give breast milk to their subsequent babies. The childbirth experience can increase the woman's knowledge about giving colostrum, so that it will affect her decision to give breast milk to the baby or not.

The limit of good nutritional status is when the size of the upper arm circumference is at least 23.5 cm, as measured on the left arm. Most respondents in both groups were in good nutritional status. According to Catherine (2021) the nutritional status of breastfeeding mothers influenced the success of breastfeeding. A total of 25.24% of mothers who have overweight BMI have a risk of not giving exclusive breastfeeding, as well as underweight mothers (15)347 women categorised into groups according to: underweight (≤ 18 kg/m²).

Table 2. Breast milk production and fundal height

Variable	Treatment			Control			P value
	Mean	Med	SD	Mean	Med	SD	
Breast Milk Production #							
Before	3117.8	3150	368.4	3030	3012	246	0.557*
After	3254	3327	349.7	3094	3100	251	
Fundal Height (cm)							
Before	11.3	11	0.78	10.8	11	0.83	0.434*
After	7.1	7.5	1.27	7.59	7.7	0.49	

*Homogeneity test

Breast milk production was assessed using the infant weight gain in gram

Descriptive Analysis

Table 2 shows an increase in the mean of breast milk production before and after rolling massage and ST-18 acupressure which was assessed by using the indicator of the mean of infant weight gain from 3117.8 grams up to 3254 grams in the treatment group. Weight gain in the treatment group was higher than the control group. Among newborns in the first 1 week, it is actually physiological if there is a decrease in body weight within the maximum limit of 10% of birth weight. In this study, there was a weight gain in most of infants after the rolling massage intervention.

Bivariate Analysis

Table 3. Difference in the mean of breast milk production before and after

Breast milk production	Treatment Mean±SD	Control Mean±SD	P value
Before	3117.8±368.4	3030±246	0.0001 ^a
After	3254±349.7	3094±251	0.0001 ^a
Difference (Δ)	136.1±287	64±36	0.0001 ^b

Table 3 shows the difference in the mean of breast milk production before and after rolling massage and acupressure on Stomach 18 point with p value of 0.0001.

Table 4 shows the difference in the mean of fundal height before and after rolling massage and acupressure on ST-18 point with p value of 0.001.

Table 4. Difference in the mean of fundal height before and after

Fundal Height	Treatment Mean±SD	Control Mean±SD	P value
Before	11±0.78	10.8±0.83	0.001 ^a
After	7.1±1.27	7.59±0.49	0.001 ^a
Difference (Δ)	-3.91±1.35	-3.24±0.58	0.160 ^b

a. pre-post with dependent t test
mann whitney test

DISCUSSION

The results showed that there was a relationship between rolling massage and acupressure. ST-18 with breast milk production (p-value 0.001). Breast milk production was measured using the baby's weight gain before and after treatment. The average weight gain in the treatment group was 3254 grams higher than the control 3150 grams. This is in line with Sulymbona's research (2020) that giving acupressure points CV 18, ST 17, and SI1 to postpartum mothers 3 times a week can increase breast milk production(16). ST18 and SI1 usually only using fingers or blunt objects that do not injure the body surface, which can provide a suppressing effect so that more acceptable and tolerated by patients. Breast milk production is influenced by the working mechanism of the oxytocin hormone and prolactin hormone, through the mechanism of let-down reflex and nipple sucking reflex done by the baby (17).

Rolling massage is one way to stimulate oxytocin through sensory nerves with massage

along the vertebrae(9). To facilitate the production of breast milk, women should always breastfeed their babies on demand. Prolactin is one of the basic hormones in the secretion of breast milk that increase of this hormone can promote breastfeeding. Stimulation of several points in the body can cause balance in the blood circulation, hormone secretion and other factors, which can increase the breast milk production and secretion(18). Stomach Meridian 18 or breast roots is one of the most functional acupressure points. Stimulating this point can help in eliminating breast problems such as pain and swelling, lack of lactation and mastitis. Acupressure technique is a technique that is guided by comfort food for the soul, therapy for patient comfort which includes massage. Acupressure on ST- 18 point, which is around 4 fingers below the breast or in the 5th rib can also increase blood circulation, which stimulates the alveolus to contract so that breast milk is secreted towards the nipple(19)unusual but accepted agents, and agents that are in favor for orthodox therapy in other countries. However, the current growth of complementary and alternative medicine is based on the use of nonorthodox remedies that are becoming increasingly popular with patients and that should be familiar to physicians. Asthma and allergies are frequently treated with such remedies by patients, either as part of self-therapy or on the advice of a complementary and alternative medicine practitioner. The most popular alternative medical treatments are herbs (Western and Asiatic. Previous research by Wulandari (2019) stated that giving acupressure at the stomach point can increase milk production (20).

Table 2 shows the mean of involution process before and after rolling massage and acupressure on ST-18 point in the treatment group which decreased from 11.3 cm to 7.1 cm after 3 days of intervention. Fundal height can be assessed after delivery by using palpation or

measuring the fundal height from the symphysis to the umbilical. On the first day of fundal height, it is about 1 finger below the umbilical and will go down 1 finger every day. Fundal height is is not palpable on the tenth to the twelfth day(21). The involution process of postpartum women can be assessed by fundal height indicator. The involution process is influenced by the oxytocin hormone. Suction by the baby on nipples will stimulate let-down reflex to release the oxytocin hormone, than stimulating the amount of breast milk production can also accelerate the process of uterine involution. The uterus that does not immediately contract will cause bleeding and uterine atony (22).

Prolactin is one of the basic hormones in the breast milk secretion and production. Based on traditional Chinese medicine, stimulation of several points in the body can cause balance in the blood circulation, hormone secretion, and other factors, which can increase the production and secretion of breast milk. Stimulation of some acupressure points can increase the levels of prolactin and oxytocin and, consequently, lead to better breast milk production. A study conducted by Yuliati (2017) stated that there was an effect of the combination of rolling massage and Oketani massage on the increase in the levels of prolactin hormone among postpartum women (9).

Factors that influenced the production of breast milk included diet factor, if the food consumed by the women was sufficient for nutrition with regular eating patterns, then the breast milk production would run smoothly, peace of mind and soul factor, women with depressed, sad and tense psychological states would reduce the volume of breast milk, breast care which was useful to stimulate the breast and influence the pituitary to expel the prolactin and oxytocin hormones; breast anatomy factor; physiological factors; rest pattern factor, if the woman was too tired, lack of rest then the breast milk production would decrease; suction or frequency of breastfeeding factor, the more often

the baby suckled on the mother's breast, the more breast milk production include drugs factor; and baby birth weight factor(23). Previous research by Hardianti (2019) compared to massage and exercise to the uterine involution process, it was found that giving massage was faster in reducing uterine fundal height compared to the exercise group (24).

Involution is a retrogressive change in the uterus which causes a reduction in the size of the uterus, postpartum involution is restricted to the uterus and changes in other organs and structures are only considered to be changes during postpartum period(22). Uterine revolution begins after the placental expulsion and will last for 6 weeks. During the involution process the number of uterine muscle cells is reduced due to the atrophy process (25)pilot randomised controlled trial was conducted to test changes in physiological and biochemical stress parameters. Ninety primiparous volunteers experiencing low back and/or pelvic girdle pain (LBPGP. The process of uterine involution begins after the birth process namely after the placental expulsion, lasts for about 6 weeks. After the placenta is expelled from the uterus, the uterine fundus can be palpated between the umbilicus and symphysis pubis or slightly higher. Rolling massage performed on postpartum mothers makes the mother more relaxed so that the body will stimulate let-down reflex to increase the production of oxytocin hormone, and affect the involution process to be faster. Previous study conducted by Aini et al., 2017 stated that there was an effect of the combination of oxytocin massage and hypnobreastfeeding on uterine involution process with p value of 0.0001.

During the postpartum period there are physiological changes occurring in the reproductive organs, especially the uterus, after the placenta is born there will be a significant decrease in the levels of estrogen

and progesterone hormones, causing the uterus as a place for implantation of the placenta compensates after the birth of placenta in the form of myometrium smooth muscle contraction. The myometrium smooth muscle serves to suppress or bind open blood vessels on the side of the placenta so that the possibility of fatal bleeding from the implantation site is less likely to occur. The hypothalamus secretes the oxytocin hormone from the posterior pituitary. To find out whether the involution process runs well or not, an examination of the fundal height can be carried out, which is measured along the symphysis pubis.

CONCLUSION AND RECOMMENDATION

Rolling massage and ST-18 acupressure had an effect on breast milk production. Thus, there is a need for socialization to midwives in carrying out holistic and comprehensive postpartum care using rolling massage and ST-18 acupressure. Postpartum women and the husbands need to understand various ways to increase breast milk production and accelerate uterine involution.

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