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DIFFERENT AMOUNT OF PROLACTIN HORMONE BEFORE AND AFTER ACUPRESSURE-AROMATHERAPY COMBINATION TECHNIQUE IN LACTATION: EPIDEMIOLOGICAL-CLINIC STUDY ON POST PARTUM MOTHER IN SURAKARTA DISTRICT HOSPITAL

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Inadequate milk production is the most common reason why mothers do not breastfeed exclusively. To overcome this problem, a stimulus could be provided in the form of breast massage, acupressure and aromatherapy massage techniques. This study is aimed to demonstrate the difference of effectiveness of combination therapy with acupressure therapy and aromatherapy in increasing levels of the prolactin hormone.

The study was a quasi-experimental non-equivalent control group design. Samples were taken using consecutive sampling of 40 first day postpartum primiparous mother. The data analyzed using paired t-test and ANOVA.

Accupressure increased prolactin level by 75.85%, whilst aromatherapy was proven to increase the prolactin of the mothers by 180.94%. Combination of accupressure and aromatherapy was shown to be the most significant treatment in increasing prolactin by 302.88% compared to prolactin level of mothers in the control group which only increased by 1.53%. This study indicates, it is necessary to apply a combination of acupressure and aromatherapy techniques to increase the level of prolactin hormone in maternal post-partum lactation.

Keywords: Acupressure, Aromatherapy, prolactin, lactation, milk production

1. INTRODUCTION

Mother's breastmilk is the main food for infants at the early 6 months of the golden period. The process of breastfeeding or also called lactation involves a complex interaction between the nutritional needs of infants and maternal physiology (Coad et al, 2007). Breastmilk is physiologically produced by the breast, containing *immunomodulator* and the complete nutrients (Venter et al, 2008; Astutik, 2013).

Exclusive breastfeeding rate in Surakarta showed a slow growth. Until 2013, the exclusive breastfeeding rate remain below the national target of 80% (Kemenkes RI, 2013; Dinkes Jateng, 2013; Dinkes Surakarta, 2013). Successful breastfeeding is influenced by various factors such as unsupported nipple, unability of the baby in suckling, working mother, and the influence of promotion of breast milk substitutes and less milk production (Siregar, 2004). Milk production itself

is influenced by two important hormones, prolactin and oxytocin. Prolactin plays a role in producing milk, while oxytocin duty to help the milk ejection (Saryono et al, 2009; Proverawati et al, 2010). Breastfeeding process will be hampered if there is interference on both hormones (Maryunani, 2012).

Correctly and regularly breast care can stimulate milk production and reduce the risk of injury while breastfeeding. Breast care during childbirth can be applied by massage and relaxation (Saryono et al, 2009). Breast relaxation massage can be done through acupressure techniques with aromatherapy massage oils (Jaelani, 2009). Acupressure technique is done by pressing acupuncture points using a finger to stimulate a response in the body (Turana, 2010). Whereas aromatherapy massage oil is one form of aromatherapy essential oils made from natural materials. Aromatherapy massage oil works through the skin absorption system and then affects the function of human organs. Both theraphy can help accelerating the flow of energy, blood circulation, lymph flow as well as the nervous system that can affect metabolism hormone. Therefore, both theraphy can be done as an attempt to increase prolactin hormone in the process of breastfeeding (Jaelani, 2009; Kemenkes, 2012).

Based on the results of preliminary studies conducted in Surakarta district hospital, two mothers (33.3%) can breastfed without any complaint, four mothers (66.7%) have not yet optimal breastfeeding in the first 3 days after birth because they feel they have less breastmilk. So far, breast crawl has been implemented widely in hospitals in Indonesia. Nevertheless, acupressure and aromatherapy has not yet been done. Therefore, this study aims to analyze the effectiveness of a combination of acupressure techniques with aromatherapy to increased prolactin in maternal post-partum lactation.

2. RESEARCH METHOD

2.1. Research design

The study design includes two important aspects, namely the research design and the approach. Experimental research is research that aims to assess the influence of a treatment or test hypotheses about whether or not an intervention has an effect when it's compared with other measures (Setiawan, 2011). The method used in this study is a quasi-experimental design with non-equivalent control group. This study is aimed to analyze the effectiveness of a combination of acupressure techniques with aromatherapy to increase prolactin in maternal post-partum lactation.

The population of this study is first day post-partum mothers in public district hospital (RSUD) of Surakarta. Consecutive sampling was employed by involving existing samples who met the study criteria included in the study until the amount required is fulfilled. The inclusion and exclusion criteria as follow:

1. primiparity,
2. age of pregnancy 37-42 weeks,
3. do not have anatomical abnormalities of the breast,
4. the upper arm circumference is not more than 25cm,
5. not taking drugs, herbs or supplements facilitating breastfeeding,
6. the birth weight infants 2500-4000 grams,
7. willing to be respondents.

Exclusion criteria include:
1. post-partum mother who are not healthy,

2. post-partum mother who have babies with congenital abnormalities,
3. post-partum mother with malnutrition.

Fourty respondents who met inclusion criteria then was divided into 4 groups: acupressure, aromatherapy, acupressure and aromatherapy combination and control groups (each group consisted of 10 respondents). The independent variable in this study is the provision of acupressure and aromatherapy techniques whilst the dependent variable is the level of the prolactin hormone.

2.2.   Procedure of data collection

Researchers assisted by experts in the field of acupressure, to provide acupressure therapy, and analysts whose job is to measure prolactin levels before and after treatment. Prior to the intervention, research subjects were familiarized with the objective of the study and also the intervention they will receive. After informed consent was obtained, participants were randomly assigned into four groups. Blood samples were taken about $\pm$ 1.5ml to measure levels of prolactin hormone before the treatment (pretest).

Respondents were divided into four group. Group I was treated with acupressure massage on the points ST 16, ST 17, ST 18, SP 18, CV 17, SI 1 and ST 36 of 30 rounds in a clockwise direction at each point. Group II was treated with fennel seed oil massage on the breast for 15 minutes. Group III treated with a combination of acupressure techniques with aromatherapy massage oil. Therapy in the treatment group I, II and III carried out for 3 consecutive days at the same time in the morning between 8-11 a.m. when the breast is empty or after breastfeeding. While the IV group as a control group receives the appropriate care hospital procedures without additional therapy acupressure and aromatherapy. Post-intervention prolactine hormone level was measured after the third day. The level prolactine hormone is calculated by analysis of blood serum Elisa method using a microplate reader in units of ng / dl.

2.3.   Data Analysis

This research was conducted at the Public District Hospital (RSUD) of Surakarta in December 2013 to March 2014. Paired t-test and ANOVA were employed in data analysis .

3. RESULT AND DISCUSSION

Characteristics of research subjects in this study are presented in the following tables:

Table.1 Distribution of respondents according to gestational age at maternal postpartum in Surakarta district hospital

Group		N	Min	Max	Mean	*p*
I.	acupressure massage	10	37	40	38,50	0,258
II.	fennel seed oil massage	10	37	41	38,60	0,445
III.	combination of acupressure techniques with aromatherapy massage oil	10	37	41	38,90	0,691
IV.	Control	10	37	40	38,60	0,245
	Total	40	37	41	38,65	

Table 1 shows the average gestational age of the respondents in all four groups was 38.65 weeks and had infant's birth weight 3000 g. Gestational age was one of the factors that affect milk production because of its correlation with infant maturity. Infants born less than 37 weeks (premature) have a weak body condition and sometimes, its organ has not yet perfectly functioned. The ability to suck milk from the breast will be less effective and thus, milk production will be lower compared to mothers with babies born at term (Proverawati, 2010; Wiji, 2013).

Table2. Distribution of respondents according to birth weight babies in postpartum mothers in Surakarta district hospital

Group	N	Min	Max	Mean	*p*
I. acupressure massage	10	2550	3300	2930	0,863
II. fennel seed oil massage	10	2500	3300	2910	0,360
III. combination of acupressure techniques with aromatherapy massage oil	10	2550	3400	2975	0,815
IV. control	10	2600	3400	2995	0,650
Total	40	2500	3400	2952,5	

Based on the frequency distribution of infants' birth weight above, the average weight of the baby in the four groups is 2952.5 grams with a standard deviation of 263.59. Each group has a value of p> 0.05 indicates that the distribution of the baby's weight in each group was normal.

The relationship between infants' birth weight with milk production volumes associated with sucking strength, frequency and duration of breastfeeding (Proverawati, 2010). Infants with low birth weight tends to have a low ability to suck both in terms of strength, frequency and duration of breastfeeding that affects the stimulation of the prolactin and oxytocin hormone in producing breast milk (Nugroho, 2011). Therefore, respondents in this study were selected with gestational age at term and those who have babies with normal birth weight. Infants at term had normal birth weight and no congenital anomalies have a healthy body condition with a more perfect organ and sucking strength, frequency and duration of breastfeeding better so that the breast will receive better stimulation and will affect the lactation.

Table 3. Differences in levels of the prolactin hormone before and after acupressure, aromatherapy, combination and the control group in the post-partum mothers in Surakarta district hospital

Prolactin Amount	Mean	*p value*
Pre group I	44,292	0,0001
Post group I	73,774	
Pre group II	55,079	0,0001
Post group II	151,058	
Pre group III	59,102	0,0001
Post group III	221,894	
Pre group IV	64,084	0,006
Post group IV	65,160	

The average level of the prolactin hormone before acupressure is 44.292 ng/ml with a standard deviation of 15.958. After acupressure for 3 days, the average levels of the hormone increased to 73.774 ng /ml with a standard deviation of 16.878. With a p-value = 0.0001, the study indicates that acupressure affects the prolactine hormone level.

Acupressure therapy is the development of acupuncture techniques. Acupressure does not use needles as in acupuncture techniques. Acupressure technique is applied by using fingers or a blunt object to improve body function by stimulating acupoint (Turana, 2004). According to the Wong theory (2010), milk production is less due to the constraints or lack Sie Ci (qi blood). Stimulation at some point in the breast and meridians is expected to launch Sie Ci and increase milk production. Acupoints selected in this study are ST 15, ST 16, ST 18, CV 17, SP 18 with the key point SI 1 and ST 36. The point is other than parallel to the nervi intercostales location is also a node of the meridian which would act as receptors that receive stimulation of the skin's surface. Stimulation is forwarded to the central nervous system through the meridian flow and flow Nodi

lymphatici, interpectoralis and parasternalis then to the hypothalamus and affect its activity in producing the prolactin hormone (Saputra, 2008; Ministry of Health, 2012; Keith et al, 2012). In practice, acupressure therapy requires the support material in the form of a cream, lotion or massage oil (Kemenkes, 2012).

The average levels of the prolactin hormone before given aromatherapy were 55.079 ng /ml with a standard deviation of 12.212. After 3 days acupressure therapy with aromatherapy oils, the average levels of the prolactin hormone was significantly increased to 151.058 ng / ml with a standard deviation of 32.246 (p value = 0.0001).

Aromatherapy massage oil is working through skin absorption system then affects the function of human organs (Jelani, 2009). Aromatherapy massage oils used in this study were a mixture of fennel seed as essential oils and Virgin Coconut Oil (VCO) as basal oil. Fennel seed (Foeniculum vulgare Mill.) contains anethole, and substances known as phytoestrogens. Phytoestrogens are plant-derived nonsteroidal compounds that have estrogenic properties (Tsourounis 2004). Phytoestrogens are substrates of plant origin that have estrogen-like properties that could stimulate milk production in nursing mothers (Maheshwari, 2009). Meanwhile, as the solvent used VCO contains lauric acid, medium chain saturated fatty compounds. This oil types can traverse the hair follicle, reaching the upper stratum corneum layer of the skin so that it can help the essential oils to be absorbed better by the body (Jilani, 2009). Thus the content of phytoestrogens in aromatherapy massage oils will be more easily absorbed by the body through the skin, into the blood circulation and lymphatic contained in the breast and lead to the hypothalamus. Phytoestrogens will influence the activity of the hypothalamus in increasing levels of the prolactin hormone to increase milk production (Koensoemardiyah 2009; Maheswari, 2009).

Massage oil is applied to the acupoint locations and combined with acupressure massage technique to make the content of phytoestrogens in the oil absorbed by the skin optimally. The combination of stimulation of the two therapies is expected to accelerate response to nerve stimulation and phytoestrogens reaches the hypothalamus and increases levels of the prolactin hormone with more leverage. The findings supports a study by Jaelani (2009) that revealed aromatherapy massage oil will be optimal if combined with massage techniques. Thus, in a combination therapy of acupressure and aromatherapy oils are the most effective therapy in the treatment group compared with the other treatments.

The average levels of the prolactin hormone prior to combination therapy between acupressure and aromatherapy is 59.102 ng / ml with a standard deviation of 16.652. After the combination therapy for 3 days, the average levels of the prolactin hormone were elevated to 221.894 ng / ml with a standard deviation of 20.684. (p-value = 0.0001).

Unlike the intervention groups, prolactin hormon in the control group after 3 days showed no significant changes. Prolactin hormone was measured at 64.084 ng / ml with a standard deviation of 21.272 at the baseline, and slightly increased to 65.160 ng / ml with a standard deviation of 21.543 (p-value=0.006).

Results of statistical calculations show that there were significant increased in prolactin hormone levels before and after the treatment in all four groups. In Group I, acupressure treatment (p = 0.0001) was able to increase prolactine hormone by 75.85% whilst aromatherapy treatment in Group II (p = 0.0001) can further accelerate the amount of prolactin hormone by 180.94%. A 3-day intervention using combination of acupressure and aromatherapy is found to increase levels of the hormone by 302.88%. In the IV group as the control group, although a slight increased (1.53%) was identified, but it was not statistically significant (p = 0.006).

Increased levels of the prolactin hormone among mothers are associated with increased milk production. It is caused by the stimulation of the breast of massage, compression aromatherapy oil as well as the physiological stimulation of the baby at the time of breastfeeding. In addition, care, massage and stimulation of the breast does not just affect the milk production, but also prevent swelling so as to maintain the smooth flow of milk in the breast (Saryono 2009; Maryunani, 2012; Astutik, 2013). Based on the data analysis, it is obtained that the combination therapy of acupressure and aromatherapy is the most effective treatment compared to other treatment groups. It is demonstrated by the average increase in levels of the prolactin hormone, which reached 302.88%.

Despite its interesting findings, this study also has some limitations. Another factors that affect prolactine hormone level such as psychological factors, nutrition, maternal age, ocupation and education should be taken into consideration for further research, accompanied by bigger samples, better sampling technique and analysis.

4. CONCLUSION

Acupressure and aromatherapy techniques are proven to increase levels of the prolactin hormone. The most effective treatment is a combination therapy of acupressure and aromatherapy with an average increase in levels of the prolactin hormone by 302.88%. It is suggested to apply the combination of acupressure and aromatherapy techniques to increase levels of the prolactin hormone in maternal post-partum lactation.

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