Kosova et al., 2016
J. basic appl. Res 2(2): 113-118

JBAAR
Journal of Basic And Applied Research
ISSN 2413-7014

The Effect on Lactation of Back Massage Performed in the Early Postpartum Period

Funda Kosova[a], Zuhal Demirtaş[b], SeldaİldanÇalım[a], Levent Sapmaz[c]

[a] Faculty of Health Science, Celal Bayar University, Manisa, Turkey
[b] Community Health Center, Akhisar, Manisa, Turkey
[c] Department of ObstetricsandGynecology,Merkez Efendi State Hospital, Manisa, Turkey

*corresponding author: fundakosova@gmail.com

Received: 29-3-2016
Revised: 17-4-2016
Published: 21-4-2016

Keywords:
Postpartum period, back massage, oxytocin, prolactin, noradrenalin

Abstract: Background & Aim: The mother's milk is by itself a sufficient food for the growth and development of a newly-born baby. Lactation begins after a woman has given birth, and it is thought that hormones, along with the physiological changes which take place, have an effect on this process. The aim of this study was to examine the levels of oxytocin, prolactin and noradrenalin and levels of the Beck Depression Scale in order to determine the effects on lactation of back massage carried out in the early postpartum period. **Methods:** We randomly assigned 60 women who had a normal delivery into two groups: a massage group and a controlgroup. TheBeck Depression Questionnaire was applied to the groups, and 2 cc blood samples were taken for measurement ofthe levels of prolactin, oxytocin and noradrenalin by the Elisa method.(Milipore Corporation, Billerica, MA, USA). **Results:** We observed that levels of noradrenalin fell to a statistically significant extent in the massage group compared with the control group ($p<0.05$), while levels of oxytocin and prolactin rose, but not by a statistically significant amount. We found that the severity of anxiety on the Beck Depression Scale fell significantly in the control group compared to the massage group. **Conclusions:** Because regularly performed back massage increases the amount of mother's milk, it will not be necessary to provide supplementary feeding for the baby's development. As a result individuals will be healthier and there will be no economic losses.

1. INTRODUCTION

The lactation period is a process with a psychosocial aspect, which begins after birth and in which physiological changes take place and an emotional bond is established between mother and baby [Gürel, 2009)]. The mother's milk is of great importance in providing the basic source of nutrition for the infant, preserving health and ensuring development. Many studies in the literature support the positive effects of breast feeding on the health of both mother and baby [(Gürel, 2009); (Sukhee et al., 2011)]. Malnutrition caused by the inability of the mother to provide milk for long enough is the cause of approximately 50% of child deaths in developing countries [(Yiğit et al., 2008)]. The continuation of support for lactation in the early postpartum period affects the early start of suckling and the baby receiving only mother's milk in the first six months.

Lactation takes place under the influence of neurohormonal mechanisms. Prolactin, produced in the anterior pituitary gland, is important for lactation since it is a hormone which is necessary for milk production. In this process, the baby suckling on the mother's breast is an important stimulus which increases the secretion of prolactin and enables successful lactation [(Yoldemir et al., 2001); (Chalmers et al., 2009)]. Another hormone which has an effect on lactation is oxytocin (6). Oxytocin secretion is stimulated by the baby's voice, touch and suckling, and by seeing the baby, and in addition to stimulating the release of milk, it helps the uterus regain its pre-pregnancy dimensions by means of uterine contractions [(Polat et al., 2010)].

Massage has a 5000-year history. It was well known to the world's oldest civilizations [(Madenci , 2007)]. Although there are studies in the literature on the effect of breast massage on mother's milk [(Chalmers et al., 2009),; (Esfahani, 2013); (Otlu, 2008)]. the number of studies on the effects of back massage on lactation is very limited. Lactation begins after a woman has given birth, and as well as being a time of physiological changes, it is thought that hormones have an effect on this process.The aim of this study was to examine the levels of oxytocin, prolactin and noradrenalin and levels on the Beck Depression Scale in order to determine the effects on lactation of back massage carried out in the early postpartum period.

2. METHODS

The study was planned by the Turkish Public Hospitals Foundation of the Turkish Ministry of Health, the ManisaMerkez Efendi Gynecology and Maternity Hospital connected to the General Secretariatof the Manisa Province Public Hospitals Association and the School of Health of Celal Bayar University, and cases were collected between January and June 2014. Ethic approval was given by Celal Bayar University clinical ethics committee.

Patients

Our study group consisted of the patients admitted to the Turkish Public Hospitals Foundation of the Turkish Ministry of Health and the ManisaMerkez Efendi Gynecology and Maternity Hospital connected to the Manisa Province Public Hospitals in order to give birth. The study group consisted of 30 patients to whom massage was given in the postpartum period, and the control group also consisted of 30 patients in the same age range, to whom massage was not given. Patients were included in the study who were between the ages of 18 and 35, had not had a risky pregnancy or birth, had had a normal birth, had eaten in the first 3-4 hours after birth, were mobile, had urinated, had suckled their baby in the first hour and had suckled the baby at least twice in a four-hour period, had no breast problem or chronic illness which would prevent suckling, and volunteered to take part in the study. Blood was taken for the study within the first four hours of admission to the maternity service when the hemogram was taken.

Data Collection

A 37-question form collecting information from the women of both groups on their socio-demographic characteristics and pregnancy and maternity history and the Beck Depression Scale were used to collect data. The blood collected was stored at -80C until analysis, and all analysis was carried out by the same methods and to the same standards. Levels of prolactin, oxytocin and noradrenalin were measured by the Elisa method (Millipore Corporation, Billerica, MA, USA), and the results are given in nanograms per milliliter.

Statistics

Nonparametric methods were performed in the cross-sectional analysis of biomedical data (Mann-Whitney U test). Two-tailed probability (p) values were calculated and statistical significance was defined as $p<0.05$. Thechi-square and t-tests were performed for the descriptive statistics. Co-variance analysis was used to determine the relationships of the demographic characteristics and the Beck Depression Scale between the two groups. All analyses were performed using the statistical software SPSS 15.00.

3. RESULTS

In this study, our aim was to investigate the levels of oxytocin, prolactin and noradrenalin as well as Beck depression levels in order to determine the effect on lactation of back massage in the early postpartum period.

There was no statistically significant difference between the massage and control groups in terms of education level or income level (Table 1).

No statistically significant difference was found between the mean ages, mean body mass indices, mean number of pregnancies or mean number of births of the women in the massage and control groups (Table 2).

Table 1. Socio-demographic characteristics of the women in the massage and control groups

Identifying characteristics	**Control Group**		**Massage group**			
	No	%	No	%	x^2/t	p
Education level						
Illiterate	4	11.4	5	14.3	$x^2 = 2.368$	0.306
Literate / Primary school	14	40.0	18	74.3		
High school or above	7	48.6	10	11.4		
Income level						
Income less than expenditure	14	40.0	8	22.9	$x^2 = 3.059$	0.217
Income equal to expenditure	19	54.3	26	74.3		
Income more than expenditure	2	5.7	1	2.8		

Table 2. Distribution of women in the massage and control groups by weight, height and body mass index

	Mean±Standard deviation	**Mean±Standard deviation**	t	p
Mean Body mass index	27.07±4.10	27.17±4.49	0.099	0.920
Mean age	26.99±4.69	27.66± 4.63	t=0.871	p=0.387
Mean number of pregnancies	2.37±1.37	2.71±1.60	t=0.961	p=0.340
Mean number of births	2.09±1.06	2.29±1.27	t=0.712	p=0.479

Table 3. Mean scores on the Back Depression Scale

Beck Depression Scale Mean Score			
	Mean±Standard deviation	**t**	**P value**
Massage group	7.62±6.68	2.526	**0.01**
Control group	4.51±2.91		

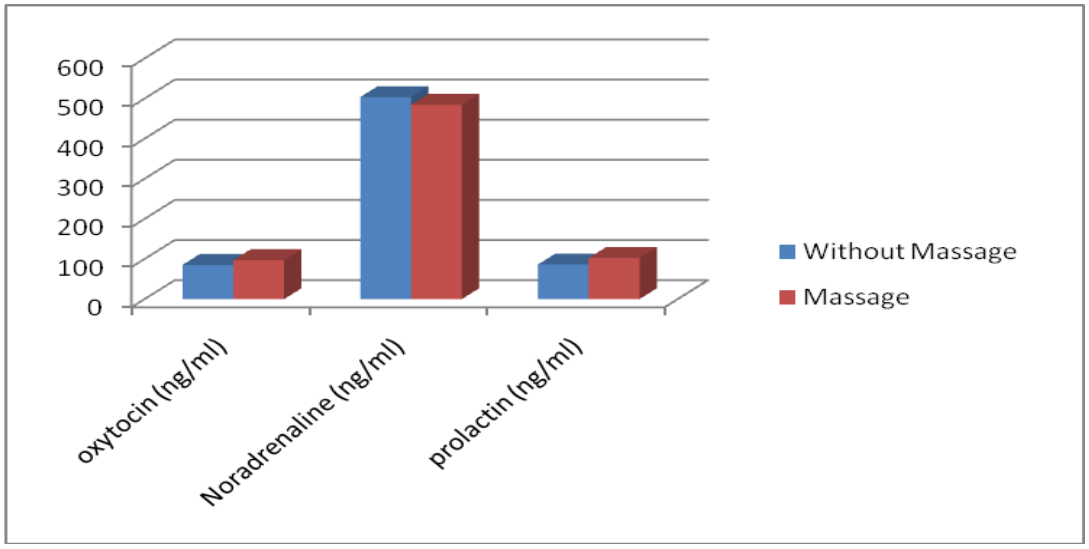

Figure 1. Hormone levels of the women in the massage and control groups

A statistically significant difference was found between the mean Beck Depression Scale scores of the women in the massage and control groups ($p<0.05$) (Table 3).

A statistically significant decrease was seen in the noradrenalin levels of the massage group ($p<0.05$) compared with the control group, and there was a non-significant but clear fall in oxytocin and prolactin levels (Graph 1).

4. DISCUSSION

The birth of a baby is an important event for a family. The best nutrition for a healthy baby is its mother's milk. Suckling helps the baby to grow and develop in a healthy way, and at the same time suckling is a healthy and positive means for biological and emotional interaction between the mother and baby. The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that babies should be fed only on mother's milk for the first six months, and that breast feeding supplemented by suitable foods should continue until the age of two [(Yiğit and Arslan, 2008); (Mangesi and Dowswell, 2010); (Britton et al., 2009)]. Starting suckling in the first half hour after birth increases the amount of milk and the total suckling time [(Mangesi and Dowswell, 2010); (Britton et al., 2009)]. Studies have shown that suckling is affected by stimuli. In the present study, we aimed to investigate whether the stimulus of back massage had an effect on the amount of mother's milk.

Examining the socio-demographic characteristics of the women in the massage and control groups, no statistically significant differences were found in mean age, educational level, profession, income level, level of relatedness to the husband or year of marriage. Nor was any statistically significant difference found between the women in the two groups in terms of mean number of pregnancies, number of births, miscarriages, abortions, the use of any kind of family planning methods, willingly becoming pregnant, episiotomy, or having had education on mother's milk. No statistically significant difference was found between the mean body mass indices of the women in the two groups.

The Beck Depression Scale was developed in 1961 by Beck. It was designed to measure the severity of depression, to monitor changes during treatment, and to diagnose illness [(Otlu, 2008); (Guy, 1976)]. It measures the somatic, emotional, cognitive and motivational symptoms seen in depression. The purpose of the scale is not to make a diagnosis of depression, but to make an objective determination of the severity of the symptoms of depression. Severity is scored as 0-9 = minimal, 10-16 = light, 17-29 = medium, and 30-63 = severe [(Kılınç and Torun, 2011)]. The scale has been translated into Turkish in two different forms under the names BDE and Beck DepresyonÖlçeği (BDÖ). The validity and reliability was tested by Hisli [(Hisli, 1989)]. In the present study, a statistically significant difference was found between the mean Beck Depression Scale scores of the women in the massage and control groups ($p<0.05$). The mean scores of the massage group were higher than those of the control group. When the severity of depression symptoms was assessed, it was seen that they were minimal with a score of 0-9 for both groups and that no monitoring was needed. It is thought that the higher mean score of the massage group may be related to the small size of the sample group. There are studies in the literature on the negative effect of depression on lactation. The minimal level of the mean scores on the symptoms of depression of both groups is important in excluding it as a factor which might be thought to affect lactation negatively. No significant difference was found between the total mean scores on the Beck Depression Scale of the

women in the massage and control groups and their education level, mean age, profession, year of marriage, total number of pregnancies, births, abortions and miscarriages, whether they had become pregnant deliberately, or their body mass index.

Hormones are chemical messengers produced in the body. In lactation, the hormones prolactin and oxytocin play a particularly active role [(Ashbee and Goldberg, 2006)]. The oxytocin and prolactin levels of the massage group in the study showed a distinct rise, although this did not reach the level of statistically significant difference ($p>0.05$). Mechanical stimulation of the uterus and vagina cause the secretion of oxytocin and this causes dilatation. During birth and coitus, this mechanical stimulation causes an increase in the secretion of oxytocin. In addition, stimulation of the touch receptors in the areola of the breast, bleeding, psychogenic stress (fear, anxiety, etc.) are other physiological factors which increase the secretion of oxytocin [(Karahan, 2010)]. Matthiesen A et al. found that maternal oxytocin levels rose when the baby's hands touched the mother's breast while they were suckling [(Matthiesen et al., 2001)]. Kotwica G et al. in a study on pigs found an increase in oxytocin levels with pressure on the udder applied by the young while suckling [(Kotwica and Okrasa, 1989)]. Ellendorff F et al. found an increase in the amount of oxytocin with breast massage and a consequent increase in milk production [(Ellendorff and Poulain, 2011)]. Gorewit et al. set out to study breast massage and milk production (the amount of oxytocin), and performed massage at five different times: no massage, and 15 minutes, 30 minutes, 60 minutes and 120 minutes before suckling. It was found that massage 30 minutes before suckling was the most effective [(Gorewit and Gassman, 1985)]. In our study we also observed an increase in oxytocin levels during back massage, although it was non-significant. This suggested to us that amounts of oxytocin may increase in relation to the duration of massage.

Prolactin is a peptide hormone with 198 amino acids. It is produced in the anterior pituitary gland under hypothalamic control. A number of factors can stimulate prolactin secretion under physiological conditions [(Avcı, 2004)]. Situations which involve stress such as physical exercise, surgery, insulin hypoglycemia, crisis and sexual relations increase the secretion of prolactin. The nature and importance of this increase has not been well understood. In women, stimulation of the nipple, breast wall trauma or surgery or Herpes zoster infection can cause a rise in prolactin levels. The only proven role of prolactin, through afferent neurons, is the initiation and continuation of lactation [(Boyd et al., 1978)]. In studies by Spinka et al. it was found that prolactin was stimulated by breast massage [(Spinka and Algers, 1995)]. In studies by Rojkittikhun et al. an increase in prolactin levels was found after calming had been achieved by massage [(Rojkittikhun et al., 1993)]. Zheng J J et al. showed a statistically significant increase in prolactin levels with breast massage using tuina, a kind of pressure method [(Zheng, 2009)]. Yokoyama Y et al. aimed to show how oxytocin and prolactin levels were affected by breast massage, and concluded that there was such an increase [(Yokoyama et al., 1994)]. In the present study, we observed a statistically significant rise in prolactin levels with massage. The data which we obtained showed that the hormone prolactin can be stimulated by massage.

Noradrenalin is a hormone which is secreted in the medulla and has an effect on the sympathetic nervous system [(Shaw, 2004)]. It was found in studies by Field et al. that massage increased levels of serotonin and dopamine and decreased levels of norepinephrine and cortisol [(Field, 2010)]. In studies by Latifses et al. it was found that massage was an effective method of lowering the level of anxiety of women giving birth [(Latifses et al., 2005)]. Lee et al. stated that massage during pregnancy had a positive effect on stress control [(Lee, 2003)]. In the present study also we found that back massage lowered the levels of the hormone noradrenalin. It was seen that noradrenalin levels were statistically significantly lower in the massage group than in the control group ($p<0.05$). It has been found in studies conducted at various stages (pregnancy and postpartum) that noradrenalin levels have fallen with calming achieved by massage. We are of the opinion that achieving maternal calm by massage will ensure the success of breastfeeding.

5. CONCLUSION

Finally, we have seen in this study that back massage causes a clear increase in the levels of the hormones oxytocin and prolactin, and a significant lowering in noradrenaline levels. We think that the reason for the increase in the total score on the Beck Depression Scale in spite of the reduction in noradrenaline levels in the experimental group may arise from the small number of patients. For this reason we recommend that the study should be conducted with a larger case group. When massage is given to a mother in the postpartum period as a kind of stimulus, it causes a rise in the levels of oxytocin and prolactin, which in turn affect the production and release of breast milk. This will allow babies to be fed only on mother's milk for the first six months of life. Thus, back massage in the postpartum period will contribute to an increase in the mother's milk and to healthier feeding of the infant without the need for any kind of food supplement. We feel that increasing the supply of mother's milk by means of back massage will help

to raise healthier future generations. We also feel that giving massage training to partners will be of benefit in supporting frequent and regular massage. We plan to repeat this study with a greater numberof postpartum cases and massage for different lengths of time.

REFERENCES

A. Polat, A., Parlak, A., Sarı, E., (2010) . Anne Sütü ve Emzirme Teknikleri. 39-44 Abdeyazdan, Z., Boroumandfar, K., Esfahani, M., Jodakee, M., S. Sheykhi, S., (2013). A comparative study on vaccination pain in the methods of massage therapy and mothers' breast feeding during injection of infants referring to Navabsafavi Health Care Center in Isfahan. Iran J Nurs Midwifery Res. 18(6), 494-98

Algers, B., Spinka, M., (1995). Functional view on udder massage after milk let-down in pigs. Appl. Anim. Behav. Sci. 43(1), 197–212

Altıntaş, A., Baksu, B., Davas, İ., Kara, A., Varolan, A., Yoldemir, T., (2001). Peripartum İntramüsküler Metoklopramid Uygulamasının Postpartum Laktasyon Başlama Zamanına Etkisi. Ege Tıp Dergisi. 40(3), 203-206

Aono, A., Irahara, M., Ueda, T., Yokoyama, Y., (1994). Releases of oxytocin and prolactin during breast massage and suckling in puerperal women. Eur J Obstet Gynecol Reprod Biol. 53(1) 17-20.

Arslan, H., Yiğit, F., (2008). Bebeğin Aldığı Anne Sütü Miktarının Değerlendirilmesi İçin Bir Araç: İmdat. 39(2), 77-84

Ashbee, O., Goldberg, JM., (2006). Hormones: A Guide For FTMs. Voncouver Coastal Health. 1-16.

Avcı, A., (2004). Behçet Hastalığında Serum Prolaktin Düzeyleri. T.C. Sağlık Bakanlığı Haseki Hastanesi Deri ve Zührevi Hastalıklar Kliniği. Uzmanlık Tezi.

Bowles, B., (2011). Breast Massage. United States Lactation Consultant Association. 4(2), 21-4

Boyd, AED., Bower, B., Reichlin, S., Spare, S., (1978). Neurogenic galactorrhea-amenorrhea. J Clin Endocrinol Metab, 47(6), 1374-77

Britton, C., McCormick, FM., Renfrew, MJ., Wade, A., (2009). SE. King, Support for breastfeeding mothers. The Cochrane Library. 10:14-22.

Bush, JP., Estroff, D., Field, T., Latifses, V., (2005). Fathers massaging and relaxing their pregnant wives lowered anxiety and faciliated maritial adjustment. Journal of Bodywork and Movement Therapies. 9(4), 277-82

Chalmers B., Dzakpasu S., (2009) What Mothers Say: The Canadian Maternity Experiences Survey, Public Health Agency of Canada, Tunney's Pasture. 5-9.

Dowswell, T., Mangesi, L., (2010). Treatments for breast engorgement during lactation. (Review) The Cochrane Library. 9:1-30

Einarsson, S., Rojkittikhun, T., Uvna¨s-Moberg, K., (1993). Plasma oxytocin, prolactin, insulin and LH after 24 h of fasting and after refeeding in lactating sows. Acta Physiol. Scand. 148(2), 413–19

Ellendorff, F., Poulain, D., (2011). A means to assess nursing efficiency in the pig: the study of the milk ejection reflex. 15(2), 271-4

Field, T., (2010). Pregnancy and labor massage. Expert Review of Obstetrics & Gynecology, 5(2), 177–81

Gassman, K.B., Gorewit, R.C., (1985). Effects of Duration of Udder Stimulation on Milking Dynamics and Oxytocin Release. Journal of Dairy Science. 68(7), 1813–18

Gölbaşı, Z., Koç, G., (2008). Kadınların Postpartum İlk 6 Aylık Süredeki Emzirme Davranışları ve Prenatal Dönemdeki Emzirme Emzirme Tutumunun Emzirme Davranışları Üzerindeki Etkisi. Sağlık Bilimleri Fakültesi Hemşirelik Dergisi. 16–31

Guy, W., (1976). Clinical Global Impressions: ECDEU Assessment Manual for Pharmacology, revised edition. Rockville, MD: National Institute of Mental Health, Dept. of Health. Education and Welfare Publication (ADM). 218-22

Gürel, P., (2009). Polikliniğimize Başvuran 6ay- 12 Ay Arası Çocukların Annelerinin; Anne Sütü ile Beslenme ve Emzirme Konusunda Bilgi Düzeyinin ve Uygulamalarının Değerlendirilmesi. T.C. Sağlık Bakanlığı Bakırköy Dr. Sadi Konuk Eğitim ve Araştırma Hastanesi Aile Hekimliği Koordinatörü ve Çocuk Sağlığı ve Hastalıkları Klinik Şefi Uz .Dr. Sami Hatipoğlu.

Hisli, N., (1989). Beck Depresyon Envanteri'nin Üniversite Öğrencileri için Geçerliği, Güvenirliği. Psikoloji Dergisi, 6(23), 13-22

K. Jinhee, K., Jungsuk, C., Sukhee, A., (2011). Effects of Breast Massage on Breast Pain, Breast-milk Sodium, and Newborn Suckling in Early Postpartum Mothers Journal of Korean Academy of Nursing. 41(4), 451-55

Karahan, N., (2010). Oksitosin İndüksiyonunun Travay Sürecine ve Perine Üzerine Etkileri. T.C Marmara Üniversitesi Sağlık Bilimleri Enstitüsü.

Kılınç , S., Torun, F., (2011). Türkiye'de Klinikte Kullanılan Depresyon Değerlendirme Ölçekleri. Dirim Tıp Gazetesi, 86(1) , 39-47

Kotwica, G., Okrasa, S., (1989). Oxytocin plasma level in the lactating sows--effect of suckling. 40(1), 104-10.

Krejcı, P., Lidicky, J., Lllmann, G., Spinka, M., Stetkova, Z., Tomane, M., Sedlak, L., (1999). Prolactin and İnsulin Levels in Lactating Sows

in Relation to Nursing Frequency. Domestic Animal Endocrinology. 17(12), 53–64

Lee, M.K., (2003). Effects of San-Yin-Jiao (SP6) acupressure on anxiety, pulse and neonatal status in women during labor, Korean J Women Health Nurs. 9(2), 138-51

Madenci, E., (2007). Klasik Masaj. Türkiye Fiziksel Tıp ve Rehabilitasyon Dergisi. 53(2), 58-61

Matthiesen, A., Nissen, E., Ransjö-Arvidson, B., Uvnäs-Moberg, K., (2001). Postpartum Maternal Oxytocin Release by Newborns: Effects of Infant Hand Massage and Sucking, 28(1), 13-19

McLoughlin, A., (2002). Massage and nursing. Journal of Community Nursing, Orthepoedic Nursing. 29(4), 254-7

Otlu, B., (2008). Üniversite Öğrencilerinin Depresyon Düzeyleri ve Aile İşlevleri. Dokuz Eylül Üniversitesi, Buca Eğitim Fakültesi Örneği, Dokuz Eylül Üniversitesi, Buca Eğitim Fakültesi Dergisi. 23: 30-35

Shaw, W., (2004). Inhibition of dopamine conversion to norepinephrine by Clostridia metabolites appears to be a (the) major cause of autism, schizophrenia, and other neuropsychiatric disorders. All these factors can now be monitored in The Great Plains Laboratory Organic Acids Test. The Great Plains Laboratory. 13(3), 1-7

Sulu N., Uzun, M., (2002). Oksitosin ve Fizyolojik Etkileri. Kafkas Üniversitesi Veterinerlik Fakültesi. 8(1), 91-7

Zheng, JJ., Zhao,P.Y., Lu, XY. Wang, (2009). Effect of Tuina at breast on postpartum lactation. Journal of Acupuncture and Tuina Science. 7(6), 375-78