THE EFFECT OF UTERINE MASSAGE DURING EARLY POSTPARTUM PERIOD ON UTERUS INVOLUTION AND AMOUNT OF LOCHIA RUBRA

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ABSTRACT

Postpartum hemorrhage is a major cause of maternal mortality and morbidity. The purpose of this study is determine the effectiveness of uterine massage on uterus involution and lochia rubra in the first postpartum 24 hours after vaginal birth**.** This is an experimental clinic study and the study sample consisted of a total of 60 women – 30 in the study group and another 30 in the control group. Those in the study group received uterine massage for 45 seconds in the first hour postpartum with 15-minute intervals and it was then continued for 45 seconds hourly until the 12th hour postpartum. The findings were evaluated at the 24th hour. The total amount of lochia in 24 hours for the women in the study group (117.60 ±35.09 g) was less than the total amount of lochia obtained from the control group (147.76±46.75 g.) and this finding was found to statistically significant (t=-2.826, p=0.007<0.05**).** Fundus height at the 24th hour postpartum for the women in the study group (1.76±1.20 cm) was lower than the umbilicus when compared to the fundus height of the women in the control group (1.23±0.95 cm); however, no statistically significant difference was detected (F=1.997, SD=3, p=0.116>0.05). In conclusion, the total amount of lochia throughout the 24 hours postpartum after vaginal birth in the study group was lower than the total amount of lochia for the control group.

Keywords: Uterine Masaj, Postpartum Care, Postpartum Hemorrhage, Loşia Rubra

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POSTPARTUM ERKEN DÖNEMDE DÜZENLİ FUNDUS MASAJININ UTERUS İNVOLÜSYONUNA VE LOŞİA RUBRA MİKTARINA ETKİSİ

ÖZET

Postpartum kanamalar en önemli maternal morbidite ve mortalite nedenidir. Bu çalışma, vajinal doğumdan sonrası, ilk 24 saat içinde yapılan fundus masajının uterus involüsyonuna ve loşia rubra miktarına etkisini incelelemek amacıyla planlanmıştır. Deneysel bir araştırma olan bu çalışmanın örneklemini 30 çalışma ve 30 kontrol grubu olmak üzere toplam 60 lohusa oluşturmuştur. Çalışma grubuna, ilk bir saatte 15 dakika arayla 45 saniye; 12. saate kadar ise saat başı 45 saniye fundus masajı yapılmıştır. Çalışma gurubu kadınların postpartum 24 saatteki toplam loşia miktarı (117,60 ±35,09 gr) kontrol grubunun toplam loşia miktarından (147,76±46,75 gr) daha az olduğu istatistiksel olarak anlamlı bulunmuştur (t =-2,826, p=0,007<0,05**).** Çalışma grubu kadınların postpartum 24 saatte ki fundus yüksekliği (1,76±1,20 cm), kontrol grubundaki kadınların fundus yüksekliğinden (1,23±0,95 cm) umblikusa göre daha aşağıda olmasına karşın istatistiksel olarak anlamlı bir farklılık saptanmamıştır (F=1,997, SD=3, p=0,116>0,05). Sonuç olarak, vajinal doğum sonrası 24 saat içinde çalışma grubunun toplam loşia miktarı kontrol grubuna göre daha az bulunmuştur.

Anahtar kelimeler: Uterus Masajı, Postpartum Bakım, Postpartum Kanama, Loşia Rubra

INTRODUCTION

About 800 women die from pregnancy- or childbirth-related complications around the world every day. In 2013, 289 000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented (1). The data of the Turkey National Maternal Mortality Study (2005) report a maternal mortality rate of 28.5 in 100,000 live births (2)**.** The Turkish Population and Health Surveys (TNSA- 2008) reported the maternal mortality rate in Turkey to be 19.5 in 100,000 live births (3).

One-fourth of maternal mortality cases result from hemorrhage that starts just before delivery, during or following delivery. Hemorrhages occurring in the first 24 hours postpartum are termed as early postpartum hemorrhages and those that occur after 24 hours are called late postpartum hemorrhage. 15.7 percent of maternal mortality cases are due to postpartum hemorrhage and such mortalities account for over 50 percent of postpartum deaths. One-third of such deaths occur within the first 12 hours after delivery (2, 4-10)**.**

International Confederation of Midwives (ICM) and International Federation of Gynaecologists and Obstetricians (FIGO) are key partners in global Safe Motherhood efforts to reduce maternal death and disability in the world. FIGO and ICM promote evidence-based, effective interventions that, when used properly with informed consent, can reduce the incidence of maternal mortality and morbidity in the world. Severe bleeding is the single most important cause of maternal death worldwide. More than half of all maternal deaths occur within 24 hours of delivery, mostly from excessive bleeding. Every pregnant woman may face life-threatening blood loss at the time of delivery; women with anaemia are particularly vulnerable since they may not tolerate even moderate amounts of blood loss. Every woman needs to be closely observed and, if needed, stabilized during the immediate post-partum period (11-13)

Physiological contraction of the uterus helps placental delivery and vasocontraction of uterine vessels, thus reducing hemorrhage (15-18). Furthermore, periodic uterine fundus massage causes uterus contraction and placental delivery by stimulating local prostaglandin release (6, 12, 18-20).

In the Abdel-Aleem et al. (2006) study: A total of 1964 pregnant women were randomly allocated to 1 of 3 treatment groups: intramuscular oxytocin, sustained uterine massage, or both treatments. Massage was sustained for 30 minutes after delivery and involved manual

stimulation of the whole surface of the uterus using steady repetitive movements by the research midwives. Blood loss within 30 minutes of delivery was recorded. In conclusion uterine massage is less effective than oxytocin for reducing blood loss after delivery.

Uterine massage is performed by pressing gently downward on the fundus and massaging with soft, circular motions using one hand and by supporting the lower part of the uterus just above symphysis pubis using the other hand to expel blood from the uterine cavity and thus to stimulate myometrial contractions (7-9, 21, 22).

Observation of uterine height and consistency constitutes an important part of puerperant care during the postpartum period. Uterus examinations aim to observe uterine height, consistency, and daily involution. The uterus should be palpable. Lack of postpartum uterine contraction is the most common cause of obstetric hemorrhage. If the uterus is not hard, strong fundal massage is indicated. This should be continued until the uterus is hardened (5, 7, 9, 10, 19, 23-25).

In the postpartum period, one of the most important responsibilities of midwives/nurses avoid atonia risk, one of the causes of postpartum hemorrhage, and to provide them with appropriate uterus massage, and to continuously monitor hemorrhage in terms of its amount and color (8-10, 19, 21, 22).

Follow up of women in the postpartum period is important for early diagnosis and treatment of possible complications. In postpartum follow-up, evaluation of uterus involution and uterus massage help diagnosing and treating possible complications earlier. The amount and color of lochia are indicators of the uterus involution and regeneration process; therefore, it is vital to monitor whether these indicators are normal. The amount of vaginal hemorrhage should be recorded and one should make sure that the uterus is well contracted by palpating the fundus (5, 8, 9, 26,).

Although it has been reported in the literature that uterine massage performed during the third stage of delivery prevents postpartum hemorrhage and reduces the amount of blood lost (11, 12, 15-18), there is no study that reports on the massage duration in the early postpartum period (in the first 24 hours) and proves its effectiveness. In the light of this information, the present study was planned to determine the effect of regular uterine massage, which is among the important tasks of midwives/nurses, upon uterus involution and the amount of postpartum hemorrhage.

MATERIALS AND METHODS

I. Design

The study was planned as a clinical study with a control group in order to examine the impact of regular uterine massage administered to women giving vaginal delivery in the early postpartum period upon uterus involution and postpartum hemorrhage**.**

II. Sample

The research was conducted at the T.C. Ministry of Health Dr. Ekrem Hayri Ustundag Hospital for Women's Diseases and Childbirth in İzmir, Turkey.

The study universe consists of women who gave vaginal birth at the T.C. Ministry of Health Dr. Ekrem Hayri Ustundag Hospital for Women's Diseases and Childbirth between 20/06/2007 and 30/07/2007.

The study sample consisted of a total of 60 women – 30 in the study group (massage group) and another 30 in the control group – who gave vaginal birth, met the research criteria (the women with no risks uterus atonia, without any chronic disease, breastfeed their babies, and agreed to participate in the study).

The results of the power analysis performed on 30 massage-group and 30 control-group women showed that the amount of lochia rubra was 81% and average fundal height was 25% in the early postpartum period.

III. Data Collection

The study data were collected by observations about face-to-face interviews and data collection forms. A questionnaire containing 38 questions about the women's socio demographic characteristics, their history of pregnancy and delivery, and information about their births at the hospital and a postpartum evaluation form used to detect the risks in the postpartum period and to monitor the women were prepared by the researchers on the basis of relevant literature.

In accordance with the hospital's procedures, all the women in the control group received only fundus examination in the first hour after delivery with 15-minute intervals and no massage. Those in the study group received uterine massage for 45 seconds in the first

hour postpartum with 15-minute intervals and it was then continued for 45 seconds hourly until the 12th hour postpartum. The findings were evaluated at the 24th hour.

Sanitary pads were weighed and lochia was examined at the 2nd-3rd-4th-6th-9th-12th sand 24th hours postpartum. Since first pads were placed at the first hour postpartum after completing the repair of episiotomies and/or perineal lacerations, pad-weighing was started at the second hour. Pad weighing and evaluation of lochia rubra were performed and noted down following uterine examinations and massage.

Involution measurement and examination of uterine consistency, size and line were carried out at the 1st-6th-12th and 24th hours.

Each patient was given standard pads, equal weight and size, and transparent self-locking nylon bags. Furthermore, the women were told how to place their pads and how to store them when they wanted to replace a pad out the hourly routine. The pads were placed into the bags, which were then locked and weighed. Fundus height of all women in the control and study groups was monitored by measuring the centimeters from the fundus down to the umbilicus using a standard measuring tape.

The women in the study group were told not to perform the massage by themselves since the researcher herself would be performing the postpartum uterine massage. Uterine massage was administered to the women in the by the researcher in the same method and by following the literature (7, 9, 21, 22).

IV. Data Analysis

The questionnaire forms used in the study were evaluated by the researcher and the data were recorded by the help of SPSS 15.0 software. The data were evaluated in the Computer Research Application Center at Ege University. The following analyses were performed to evaluate the data collected in accordance with the study purpose.

1. Identifying information about the women in the massage and control groups are given in percent.

2. A chi-square significance test was performed to test whether there was a difference between the women in the massage and control groups with regard to their independent variables.

3. RMA (Repeated Measures Anova) and LSD, One-way Anova and LSD, and t-test were employed to examine the intergroup difference of the total amount of lochia and fundus

height in the massage and control group women and their difference with the independent variables.

V. Ethical Approval

Approval of the Ethics Committee of the School of Nursing, Ege University was obtained. Permission was also obtained from the T.C. Ministry of Health Dr. Ekrem Hayri Ustundag Hospital for Women's Diseases and Childbirth to apply the study. Furthermore, the mothers were informed before the interviews about the study purpose, potential benefits of the research, and the time they would spend on the interviews. Women in the study group gave their written consent, while verbal consent was obtained from the women in the control group.

RESULTS

No statistically significant difference was detected between the massage and control groups with regard to the age, number of pregnancies, number of deliveries, number of miscarriages, number of abortions, weight gain during pregnancy, body mass index at pregnancy, week of pregnancy of the women in the study sample and the status and duration of induction application at labor, duration of the third stage labor (min), time of the first postpartum micturition, time of the first breastfeeding of the newborn, weight of the newborn for the women in the study sample ($p>0.05$). From the findings obtained, it can be concluded that the women in the massage and control groups have a homogenous distribution.

The Repeated Measures Anova (RMA) analysis revealed no significant difference between the average fundus heights of the women in the control and study groups ($F=1.997$, $SD=3$, $p=0.116>0.05$). Fundus heights of the women in the study groupwere more below the umbilicus particularly at the 12^{th} and 24^{th} hours when compared to the control group; yet, the difference was not found to be statistically significant (Table 1).

Table 1. Postpartum Fundus Height at the 1st-6th-12th and 24th Hours

Time	Fundus Height (cm)					
	Study group			Control Group		
	n	X	Ss	n	X	Ss
1st hour	30	0.81	0.85	30	0.80	0.76
6th hour	30	1.31	1.15	30	1.21	0.97
12th hour	30	1.75	1.16	30	1.31	0.90
24th hour	30	1.76	1.20	30	1.23	0.95

(p>0.05)

No statistically significant difference was detected between the massage and control groups with regard to postpartum fundus height and pregnancy, parity, newborn's first breastfeeding time (Table 2).

Table 2. Postpartum Fundus Height and Pregnancy, Parity, Newborn's First Breastfeeding Time

	Study group			Control group		
Pregnancy	**N**	$\bar{X}$	**Ss**	**N**	$\bar{X}$	**Ss**
1	17	1.62	0.99	17	1.09	1.02
2	6	2.92	0.66	6	1.50	1.05
3	7	1.14	1.46	7	1.36	0.75
Parity						
0	18	1.69	1.02	18	1.08	0.99
1	5	2.90	0.74	5	1.60	1.14
2	7	1.14	1.46	7	1.36	0.75
Newborn's First Breastfeeding Time						
10-19 min	16	1.91	1.31	12	1.21	1.08
20-29 min	9	1.67	0.97	7	0.93	0.73
30 min ve ↑	5	1.50	1.41	11	1.45	0.96

(p>0.05)

Repeated Measures Anova (RMA) analysis revealed a statistically significant difference between the lochia amounts of the control and study group women measured at different times (F=618, SD=1, p=0.006<0.05) (Table 3). The results of the LSD test demonstrated that "post hoc" study group women had lower average lochia amount at the 2^{nd}-3^{rd}-4^{th}-6^{th}-12^{th} hours when compared the control group.

Table 3. Total Amount of Lochia for 24 hours Postpartum

	Amount of Lochia (gr)					
	Study Group			**Control Group**		
	n	**X**	**Ss**	**n**	**X**	**Ss**
2^{nd} hour	30	21.00	10.82	30	24.80	12.55
3^{rd} hour	30	12.83	5.64	30	17.56	7.52
4^{th} hour	30	10.26	4.76	30	13.66	6.22
6^{th} hour	30	13.36	8.49	30	18.30	8.85
9^{th} hour	30	16.40	8.14	30	20.23	12.49
12^{th} hour	30	13.20	6.70	30	23.83	15.28
24^{th} hour	30	30.53	15.80	30	29.36	14.76

(p<0.05)

The total amount of lochia throughout the 24 hours postpartum for the women in the study group(117.60 ±35.09 g.) was lower than the total amount of lochia for the control group (147.76±46.75 g.), a difference which was found to be statistically significant (t=2.826, p=0.007<0.05) (Table 4).

Table 4. Total Amount Of Lochia For Postpartum 24 Hours (gr)

	Total Amount of Lochia		
	n	**X**	**Ss**
Study Group	30	117.60	35.09
Control Group	30	147.76	46.75

($p<0.05$)

No statistically significant difference was detected between the massage and control groups with regard to total amount of lochia for postpartum 24 hours and pregnancy, parity, newborn's first breastfeeding time (Table 5).

Table 5. Total Amount of Lochia (gr) and Pregnancy, Parity, Newborn's First Breastfeeding Time

	Study Group			Control group		
Pregnancy	**N**	**X**	**Ss**	**N**	**X**	**Ss**
1	17	112.47	32.91	17	148.76	52.24
2	6	111.66	20.09	6	153.00	47.20
3	7	135.14	47.54	7	140.85	36.69
Parity						
0	18	112.22	31.94	18	147.22	51.10
1	5	112.40	22.37	5	159.4	49.78
2	7	135.14	47.54	7	140.85	36.69
Newborn's First Breastfeeding Time						
10-19 min	16	116.06	39.68	12	143.16	43.46
20-29 min	9	115.22	29.90	7	148.14	46.40
30 min ve ↑	5	126.80	33.30	11	152.54	54.03

($p>0.05$)

DISCUSSION

Guidelines for the prevention of postpartum hemorrhage recommend routine massage of the uterus after delivery of the placenta (1, 13, 22, 23). Uterin massage stimulate uterine contraction, and thus reduce postpartum hemorrhage (1, 14-19, 21-26). However, there has been very little empirical research to evaluate the effectiveness of this method

At this research, as a result of the analysis performed to examine the average amount of lochia at different times. Statistical difference was found between the massage and control groups' amount of lochia during the time of massage administration (in the first 12 hours). But, there was no difference amount of lochia between study group(30.53±15.80 g.) and control group (29.36±14.76 g.) after massage was stopped (12^{th} -24^{th} hour). From this finding, we can conclude that massage is effective in reducing the amount of lochia as long as it is performed.

The amount of lochia are indicators of the uterus involution and regeneration process and total amount of lochia ranges between 150-400cc (9). In their first randomized study on uterine massage, Abdel-Aleem et al. (2006) arrived at significant results showing that uterine massage performed at the third stage of labor reduces hemorrhage in 30 minutes and 60 minutes.

The total amount of lochia in 24 hours postpartum for the women in the study group(117.60 ±35.09 g) was less than the total amount of lochia obtained from the control group (147.76±46.75 g.) and this finding was found to statistically significant (t=-2.826, p=0.007<0.05**).** This study demonstrated that uterine massage performed for 45 seconds hourly after delivery is effective in reducing the amount of lochia.

Immediately after the delivery of placenta, the fundus is slightly below the umbilicus and the uterus later regains its normal size at the 12^{th} day postpartum by shortening about one centimeter per day (5, 7, 24). Average fundus height of the women in the study groupat the 24^{th} hour postpartum (1.76±1.20 cm) was more below the umbilicus when compared to the average fundus height of the women in the control group (1.23±0.95 cm); yet, the difference was not found to be statistically significant. This study assessed the strength of power analysis to evaluate fundus height, which was found to be 25%. We believe that statistically significant results can also be obtained if a larger sample of women can be studied. Thus, massage is argued to accelerate the involution process.

CONCLUSIONS

Regular uterine massage performed for 45 seconds hourly after delivery accelerates the involution process. Regular uterine massage is believed to quicken postpartum healing and prevent possible complications. In conclusion, uterine massage is effective after vaginal births. Uterine massage should be done for reduce lochia rubra in the first postpartum 24 hours after vaginal birth.

Limitations of this study include no risk groups in terms of postpartum hemorrhage. We recommend that the efficiency of uterine massage should also be investigated after cesarean births and other groups. Furthermore, there is a need for further studies that will examine the effect of massage on fundus height using larger samples.

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