Clinical and Experimental Health Sciences

The Effects of Petroleum Jelly Perineum Massage on Episiotomy and Perineum Healing in the 1st Stage of Labour: A Randomised Controlled Trial

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ABSTRACT

Objective: The aim of this study was to investigate the effect of perineal massage on petroleum jelly episiotomy and perineal healing in nulliparous women.

Method: The single-blind randomized controlled trial was conducted on 90 nulliparous women. In the interventions group, perineal massage was performed with petroleum jelly and without petroleum jelly from the active phase of labor. Control group no interventions were performed.

Results: Perineal massage with petroleum jelly in the intervention group significantly decreased the rate of episiotomies (40%) compared to another group ($p<0.01$). In the control group, the mean labor time was 10 hours 52 min, while in the perineal massage group with petroleum jelly, this duration was determined to be 9 hours 32 min ($p<0.01$). The rates of redness (30%), edema (13.3%), and ecchymosis (3.3%) were statistically significantly higher in the control group ($p<0.01$).

Conclusion: Perineal massage with petroleum jelly could be suggested as an effective method to decrease the rate of episiotomy and labor time in vaginal labor.

Keywords: Perineal massage, episiotomy, perineal healing, nulliparity, petroleum jelly

1. INTRODUCTION

Perineal trauma caused by birth is defined as spontaneous or episiotomy-induced damage in the genital area during childbirth. Spontaneous perineal traumas are often classified by the authorities as follows. In this classification;

1st-degree tear; rupture of the perineal skin along with the vaginal epithelium;

2nd-degree tear; rupture of the perineal muscle (the anus sphincter is intact),

3rd-degree tear: the injury includes the complex of the anus sphincter,

4th-degree tear: complex rupture of the anus sphincter and this rupture is recognized as one extending to the rectal mucosa (1,2).

Listed in the group of non-spontaneous trauma, episiotomy involves the same muscle and tissue as a 2nd-degree tear. But in countries where episiotomy is frequently performed, it is reported that the perineal trauma rate is higher (3,4). According to current statistics, 65% of multiparas and almost all nulliparous (over 95%) are routinely performed episiotomies in our country (4). Whereas, according to WHO's Safe Motherhood Report, there is no reliable evidence that routine use of episiotomy is beneficial (5).

Episiotomy leads to such complications as postpartum perineal pain, dyspareunia, pain and infection in the perineal region, risk of contamination with urine and stool, pain and prolongation of the healing process, the relationship between mother and infant, and postpartum sexual life being affected adversely (6,7). Furthermore, the repair of episiotomy prevents skin-to-skin baby contact and early breastfeeding in the first half hour, which is highlighted as the golden time according to SOGC (8,9). Therefore, it is recommended to limit the routine use of episiotomy to reduce non-spontaneous perineal traumas. According to WHO, episiotomy is an initiative that should not be applied unless it is mandatory, causes more damage than its benefits, and should be used only on limited indications and not exceed 20% (5).

It is reported that perineal massage, kegel exercises, yoga, and plates in childbirth that are performed at any time starting from the gestational week 35 until the labor will reduce spontaneous/ non-spontaneous perineal trauma and episiotomy. One of the frequently used methods of reducing perineal trauma in childbirth is perineal massage, and important studies on its effectiveness are also available (4,10). Inconsistent studies have been reported on perineal massage techniques, timing, and effect (11,12). It appears

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that more research is needed to examine the effect of perineal massage on perineal area injuries during labor.

Petroleum jelly (Ministry of Health product) has the feature of locking moisture and accelerating the natural healing process of the skin, helping to heal from the inside, and creating an impermeable barrier between the cells on dry or damaged skin. Its occlusive function allows it to protect dry skin, cracked skin, minor cuts, and scraps (13). It is anticipated that petroleum jelly can be used for perineal massage due to its intense lubricity effect, immediate adaptation to body temperature, and safety. Perineal massage during childbirth is cheap and safely can be done. To the best of our knowledge, a limited study was conducted on the effect of petroleum jelly massage on perineal trauma. This study was designed to examine the effect of perineal massage with petroleum jelly on episiotomy and perineal healing in nulliparous women in active stages of labor. To our knowledge, only a limited number of studies have examined the effect of perineal massage with petroleum jelly during the first stage of labor on the second stage of labor. This study was designed to examine the effect of perineal massage with petroleum jelly on episiotomy and perineal healing in nulliparous women in the active stage of labor.

2. METHODS

2.1. Design

This single-blind randomized clinical trial was executed from November 2018 to April 2019. In this study, participants in the experimental group and the massage practitioner were aware of which group they were in due to the nature of the study. However, the physician who managed the childbirth did not know which group the participants were in. REEDA scores and perineal tears were assessed by physicians. Furthermore, experimental and control groups were coded to eliminate statistician bias. The sample size was estimated at 30 participants in each group considering a 95% confidence interval (α = 0.05) and power of 90% (β = 0.1). This study was designed to determine the effect of perineal massage performed using petroleum jelly from the first stage of childbirth (active phase) until its second phase on perineal trauma and the level of perineal healing.

Inclusion criteria

In the inclusion criteria, homogeneity was ensured by excluding any woman who had a risk in her pregnancy and who was predicted to have a risk in her labor. Inclusion criteria were to become a volunteer, not to any risk in pregnancy (bleeding, hypertension, diabetes, excessive weight gain, etc) and labor (EMR, pelvic measurement, pain dysfunction, fetal distress, psychic problems ETC), to be in a singleton pregnancy, to be at weeks 37-40 of the pregnancy.

Exclusion criteria

Those with a birth weight of more than 4000 g (according to ultrasound calculation) and those with HPV and similar infections were excluded from the study.

2.2.Setting and Sample

The research was executed at Maternity State Hospital at Arnavutköy. All participants were informed about the aim of the study, and the necessary written consent forms were obtained. In the study conducted by CONSORT 2010 manual (14), randomization was created using the Random org site (https://www.randomizer.org/) (15) (Figure 1). The flow of the research is presented in Figure 2.

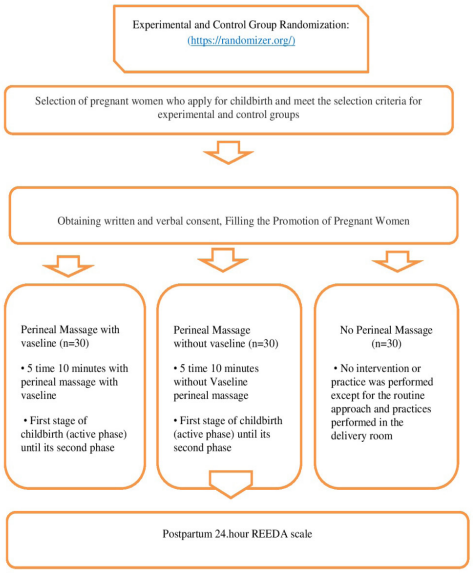

Figure 1. *Research flow chart*

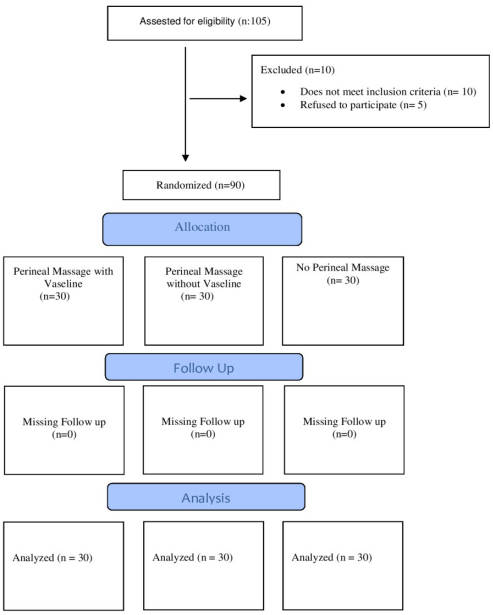

Figure 2. *Consort flow chart*

2.3.Ethical Consideration

Approval of the Marmara University Faculty of Medicine Ethics Committee (02.11.2018/ 09.2018.709) was obtained for the study.

2.4.Measurements/Instruments

Among the participants included in the experiment groups, those with a cervical opening of 4-5cm and above performed a 10 cc syringe with liquid petroleum jelly perineal massage using and not using petroleum jelly (2 groups) in the active phase of the labor until the second phase by the researcher when no contractions. The perineal massage was performed with the pregnant women in a supine position and with their bladders empty. The perineal massage was performed five times in total until full dilatation was achieved. The researcher sit on the right side of the pregnant woman facing the participant and performed the massage by moving two fingers (index and middle fingers) in a 'U' shape from one edge of the vagina to its other side for 10 minutes (Figure 3). Only hospital protocols were applied to the control group and no additional interventions were performed. All women gave birth in a lithotomy position. None of the participants had labor induction and crystal maneuvering. The childbirth was practiced by obstetricians who were blinded to the study groups. Redness, ecchymosis, edema, discharge, and approximation in the perineum based on the REEDA scale on the postpartum hours 24th were evaluated by an obstetrician who was blinded to the study groups.

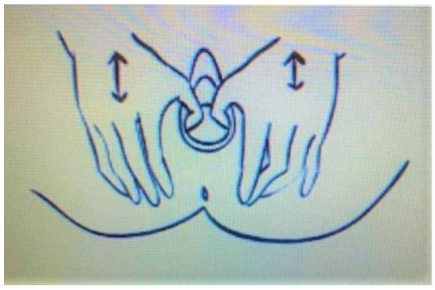

Figure 3. *Perineal massage*

Only hospital protocols were applied to the control group and no additional interventions were performed. All women gave birth in a lithotomy position. None of the participants had labor induction and crystal maneuvering. All childbirth presentations were occiput anterior, there was no scar, inflammation, edema, etc. in the perineal area and mediolateral episiotomy was performed by physicians when necessary.

Redness, ecchymosis, edema, discharge, and approximation in perineum based on the REEDA scale the postpartum hours 24th were evaluated by an obstetrician who was blinded to the study groups (Table 4).

2.5. Data Analysis

The data obtained from the research were statistically analyzed using the Statistical Package for Social Sciences (SPSS) Subscription trial version. Data were analyzed using Chi-square, t-test, and Mann-Whitney.

3. RESULTS

The socio-demographic characteristics of the women participating in the study are presented in Table 1. The results of this study showed that all three groups were homogeneous in terms of demographic characteristics at the beginning of the study ($p<0.05$) (Table 1). Results showed that episiotomy in the perineal massaged with petroleum jelly group was significantly lower (40%) than in the control group ($p<0.01$) (Table 1).

In this study, 1st-degree (3 petroleum jelly massages, 1 without petroleum jelly massage) and 2nd-degree (2 control) perineal trauma occurred. However, there were no statistically significant differences in perineal trauma in the three groups (Table 2).

Table 1. *Characteristics of the participants (n=90)*

Characteristics	Perineal massage with petroleum jelly (n=30)		Perineal massage without petroleum jelly (n=30)		No perineal massage (n=30)		Total (n=90)		Analysis
Age Mean±SD	24.43 **±4,40**		23.50 **±3.55**		22.62 ±3.87		23.52 **±4.00**		F=3.15* p> 0.45
Gestational Week Mean±SD	38.40 **±1.16**		38.53 **±0.97**		38.60 **±1.07**		38.51 **±1.06**		F=0.86* p> 0.42
Infant Birth Weight Mean±SD	3106.83**±594.87**		3046.80**±403.46**		3086.83**±409.40**		3175.53**±500.10**		F=.00* p> 1.00
Gestational Weight Gain Mean±SD	12.50**±3.35**		13.10 ± 3.74		11.38**±3.15**		12.33**±3.48**		F=0.83* p> 0.92
	n	%	n	%	n	%	n	%	
Educational Level									
8 years ↓	13	43.3	19	63.3	16	53.3	48	53,3	χ^2 =2.79 p> 0.10
9 years ↑	17	56.7	11	36.7	14	46.7	42	46.7	
Body Mass Index									
25-31	7	23.3	8	26.6	15	50	30	33.3	χ^2 =15.30 p> 0.15
32-40	23	76.7	22	73.4	15	50	60	66.7	

**One-way ANOVA*

Table 2. *Comparison of perineal trauma grades (n=90)*

Perineal Trauma Grades	Perineal massage with petroleum jelly (n=30)		Perineal massage without petroleum jelly (n=30)		No perineal massage (n=30)		Total (n=90)		Analysis
	n	%	n	%	n	%	n	%	
1st degree									
No	27	90.0	29	96.6	30	100	86	95.5	χ^2 =2.55 p> 0.27
Yes	3	10.0	1	3.4	0	0	4	4.5	
2nd degree									
No	30	100	30	100	28	93.3	88	97.7	χ^2 =6.45 p> 0.40
Yes	0	0	0	0	2	6.7	2	2.3	
Episiotomy									
No	18	60	13	43.3	8	26.7	39	43.3	**χ^2 =6.652 p< 0.01**
Yes	12	40	17	56.7	22	73.3	51	56.7	

There is a statistically significant difference among the groups in terms of duration of labor. In the control group, the labor mean-time was 10 hours 52 min, while in the perineal massage group with petroleum jelly, this duration was determined to be 9 hours 32 min (p< 0.05) (Table 3).

Table 3. *Comparison of participants in terms of labor duration*

Labor Duration	Perineal massage with petroleum jelly (n=30)	Perineal massage without petroleum jelly (n=30)	No perineal massage (n=30)	Analysis
	Mean±SD	Mean±SD	Mean±SD	
First stage duration (from 4-5 cm to 10 cm)	516.00±38.11	570.00±45.93	579.00±43.97	**F=19.01** p< 0.01**
Second stage duration	43.2±7.36	47.6±8.39	52.5±4.76	**F=18.70** p< 0.01**
First & second stage duration	559.2±45.47	617.6±54.32	631.5±48.73	**F=8.02 p< 0.01**

**Minutes **One-way ANOVA*

Redness, edema, ecchymosis, discharge, and approximation did not develop in perineal massage with the petroleum jelly group at all based on the REEDA scale. The rates of redness (30%), edema (13.3%), and ecchymosis (3.3%) were statistically significantly higher in the control group (p< 0.05) (Table 4).

Table 4. *Comparison of participants in terms of the REEDA scale*

REEDA Scale	Perineal massage with petroleum jelly (n=30)		Perineal massage without petroleum jelly (n=30)		No perineal massage (n=30)		Analysis
	n	%	n	%	n	%	
Redness							
Yes	0		5		9		**χ^2 =39.05 p< 0.01**
No	30		25		21		
Edema							
Yes	0		1		4		**χ^2 =5.506 p< 0.04**
No	30		29		26		
Ecchymosis							
Yes	0		0		1		-
No	30		30		29		
Discharge							
Yes	0		0		0		-
No	30		30		30		
Approximation							
Yes	0		0		0		-
No	30		30		30		

4. DISCUSSION

In our country, episiotomy is routinely performed in nulliparous and frequently in multiparas. Midwives and obstetricians perform episiotomy thinking that it will expand the birth canal and facilitate childbirth (17). In the present study, the rates of episiotomy that developed in the group of perineal massage with petroleum jelly, the group without petroleum jelly perineal massage, and the control group that was not performed perineal massage were 40, 57%, and 74%, respectively. The results showed that perineal massage with petroleum jelly in the intervention group significantly reduced episiotomy compared to the other group. Geranmayeh et al. (13) performed perineum massage with petroleum jelly in the second phase of birth and found a higher rate of intact perineum in the massage group (p<0.01). The finding of perineal massage to reduce trauma is in parallel with similar studies in the literature (18,19). Studies are reporting that the perineal massage performed increases perineal flexibility and decreases perineal traumas and episiotomy application (20,21). On the contrary Harlev et al. (22) conducted a study where they compared the use of fat rich in vitamins (vitamins B1, B2, B6, E) with liquid wax (jojoba oil) for perineal massage performed at the second stage of labor and found no difference between the oils used in the latter. A study showed that perineal massage with gel was safe in terms of maternal and neonatal results, but it did not significantly contribute to perineal integrity (23). This difference may be due to the phase of labor, parity, patient position, and the lubricant used in perineal massage.

In our study, no tear rates were found in the 2nd, 3rd, and 4th grades of women who underwent perineal massage. In the literature in parallel with our findings, Shahoei et al. (10) and Magoga et al. (24) similarly found that the rate of perineal trauma of 2nd degree was lower in the experiment group (22.4%). The findings of eight randomized studies by Aasheim et al. (21) that included 11.651 women who were performed perineal massage showed that the perineal massage reduces the rate of tears of 3rd and 4th degrees and the need for episiotomy (p>0.05). It was shown that perineal massage and hot application reduce the perineal traumas of third and fourth degrees (21,25). It appears that a slow and gentle massage can increase perineal stretch with increased blood circulation. Unlike these findings in a clinical trial by Albers and Borders (26), Mei-dan et al. (27) and Ashwal et al (23) found no significant difference between the intervention and control groups regarding the effect of perineal massage on perineum health (27). These dissimilarities can be associated with racial differences, differences in the quality and duration of the massage, and material used in massage or patient position.

Perineal trauma and lacerations delay perineal healing. In the present study, according to the perineal area evaluation based on the REEDA scale, higher rates of redness (30%) edema (14%), and ecchymosis (4%) developed in the control group (p< 0.01). The massage stimulates the peripheral receptors on the skin, which reach the brain through the spinal cord (28). Thus, massage promotes the release of endorphins, reduces local ischemia, increases blood supply, lymph circulation, and oxygenation of tissues, and promotes the dilatation of arterioles (28,29). Also, less perineal trauma may accelerate perineal healing.

In the current study, it was determined that the duration of labor in the perineal massage with the petroleum jelly group was the shortest compared to the other two groups. The findings of the present study are in parallel with the literature (13). Akhlaghi et al. reported the mean durations of the second stage of labor in the control and perineal massage groups were 55 and 45 minutes, respectively whose findings are consistent with our results (29). One study inconsistent with the results of this study showed that perineal massage with a water-soluble lubricant during the first stage active phase of perineal massage did not affect labor time (30). The shortening of labor time may be due to the content of the petroleum jelly. For all these reasons, perineal massage during childbirth appears to be a challenging issue that requires more research given the confusing factors.

5. CONCLUSION

The findings determined that the perineal massage with petroleum jelly in the first stage of labor increases perineal integrity and decreases perineal traumas. So, perineal massage can be an effective way to maintain intact perineum during labor. It is recommended that midwives working in the childbirth room should be trained to reduce episiotomy attempts with in-service training programs, perineal massage with petroleum jelly should be taught and applied in trauma, petroleum jelly can be used in the second stage of labor, and randomized controlled studies investigating the efficacy of substances other than petroleum jelly that can be used in the perineum to prevent perineal trauma should be conducted.

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Design of the study: MDB, YIÇ
Acquisition of data for the study: YIÇ
Analysis of data for the study: MDB, YIÇ
Interpretation of data for the study: MDB, YIÇ
Drafting the manuscript: MDB, YIÇ
Revising it critically for important intellectual content: MDB
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