ANATOL J FAMILY MED
The Anatolian Journal of Family Medicine

Original Article

DOI: 10.5505/anatoljfm.2023.60024
Anatol J Family Med 2023;6(1):7–12

The Effect on Perceived Pain of Ice Massage Applied to Large Intestine-4 Pressure Point during Episiotomy Repair: A Randomized Controlled Trial

Bihter Akın,[1] Yeşim Yeşil,[2] Birsen Karaca Saydam,[3] Hafize Öztürk Can[3]

[1]Department of Midwifery, Selcuk University, Konya, Türkiye
[2]Department of Midwifery, Artuklu University, Mardin, Türkiye
[3]Department of Midwifery, Ege University, İzmir, Türkiye

ABSTRACT

Objectives: This study aimed to determine the effect on perceived pain of ice massage applied to the Large Intestine-4 (LI4) pressure point during episiotomy repair.

Methods: Research data were collected between April 15, 2018, and December 15, 2018. Women who met the criteria for inclusion in the study and had an episiotomy performed by a midwife were assigned to the intervention or control group according to the randomization scheme. Women assigned to the intervention group were given plastic gloves filled with ice pieces just before the episiotomy repair began, and they were asked to press the glove into the LI4 region in their hands until the episiotomy repair was finished. The routine practice was carried out with the women in the control group. The questionnaire containing sociodemographic and birth-related information and a Visual Analogue Scale (VAS) were applied to all women.

Results: A total of 347 women, 178 (51.0%) in the intervention group and 169 (49.0%) in the control group, were included in the study. There was no difference between the intervention group and the control group in the scores obtained from the VAS before the ice application (6.0 (6.0-7.0) vs. 6.0 (6.0-7.0), p=0.530). On the other hand, a significant difference was found between the mean VAS scores of women in the intervention and control groups after ice application (4.0 (4.0-6.0) vs. 5.0 (5.0-6.0), p=0.001).

Conclusion: It was determined that ice massage applied to the LI4 pressure point in the hands during episiotomy repair significantly reduced the perceived pain level.

Keywords: Episiotomy, midwifery, pain management

Please cite this article as: Akın B, Yeşil Y, Karaca Saydam B, Öztürk Can H. The Effect on Perceived Pain of Ice Massage Applied to Large Intestine-4 Pressure Point during Episiotomy Repair: A Randomized Controlled Trial. Anatol J Family Med 2023;6(1):7–12.

Address for correspondence: Dr. Bihter Akın. Department of Midwifery, Selcuk University, Konya, Türkiye

Phone: +90 505 670 32 28

E-mail: bihterakin@yahoo.com

Received Date: 10.04.2022
Revision Date: 23.06.2022
Accepted Date: 18.04.2023
Published online: 28.04.2023

INTRODUCTION

Perineal trauma is defined as spontaneous damage or damage caused by episiotomy during a vaginal delivery that inflicts perineal pain.[1] Perineal pain, which is described by women as an unpleasant condition, must be reduced or eliminated completely through good management to contribute to the physical and psychological recovery of the mother. Local anesthetic agents are applied before an episiotomy and before starting repair to provide effective pain management.[2-5] However, previous studies have determined that despite the application of different anesthetic agents, the need for analgesics was not completely eliminated during and after episiotomy repair.[1,6,7] Although non-pharmacological agents are mostly used for the management of labor pain, they have also been used to reduce perceived pain during episiotomy repair.[7-12]

One of the non-pharmacological methods that can be used during episiotomy repair is ice massage and pressure applied to the large intestine 4 (LI4) (hegu) energy meridian point in the hand.[13] This point is located at the medial midpoint of the first metacarpal, between the thumb

and the forefinger 3–4 mm from the skin web gloves are first filled with about 30 cc of water and then frozen and wrapped in gauze; women are asked to apply this ice to acupuncture points during contractions. In the literature, there are studies to determine the effects of ice massage applied to the LI4 region during the active phase of labor on the birth process. In the study of Can and Saruhan, it was determined that ice massage applied to the LI4 region during the active phase of labor was effective on postpartum pain. In other studies, it was determined that women who received ice massage during the intrapartum period felt less pain in the active phase of labor compared to those who did not and the first stage of labor lasted shorter in these women.[14,15] Although there are studies to determine the effects of ice massage applied to the LI4 region on the labor and postpartum period, no studies focusing on the effects during episiotomy repair were found. Non-pharmacological applications are performed by midwives to reduce the pain experienced by women during the intrapartum period. However, pain management during episiotomy repair is a neglected area. It is thought that ice massage applied to the LI4 region of the hand is a method that can be used safely during episiotomy repair, but no relevant studies have been found in the literature. It is thought that when pain management is done well during episiotomy repair, the woman will perceive the birth experience more positively, and therefore, it will have positive contributions to the health of the mother and baby. The aim of this study is to determine the effect of ice massage applied to the LI4 region during episiotomy repair on the perceived pain level of women.

METHOD

This is a randomized controlled experimental study. Women between the ages of 18 and 35 years who gave birth for the 1st time, gave birth to a single baby vaginally and underwent episiotomy during delivery were included in the study. Research data were collected at Buca Gynecology and Pediatrics Hospital between April 15, 2018, and December 15, 2018.

Women who met the criteria for the inclusion in the study and had an episiotomy performed by a midwife were assigned to the intervention or control group according to the randomization scheme. A simple randomization method was used in the study. First, the numbers (1 or 2) to be given to the study and control groups were randomly determined by throwing a coin. Number 1 was the intervention group, and 2 was the control group. Double-column groups between 1 and 384 were created with the help of a Random Integer Generator under the numbers header of the Random.org website. Women were assigned to a group according to the numbers (1 or 2) in the columns. Each room in the delivery section accommodated one woman. This was a single-blind study: the researcher knew which group each participant was in, but the participants were not informed. Six midwives were selected by the researchers after being observed during at least one birth before the study was conducted. The six midwives had a similar amount of experience and used the same suture technique during the study. Before the episiotomy repair, a local anesthetic (Lidocaine) of 5 mL was applied directly to the episiotomy area with an appropriately sized injector by the midwife. After an average of 5 min, the repair was started. Women who agreed to participate in the study and who were assigned to the intervention group were given explanatory information immediately before the episiotomy repair began (after delivering the placenta and having the local anesthetic agent injected); they were given plastic gloves filled with ice pieces and asked to press the gloves in the LI4 region of their hand. The ice was applied first for 5 min to the hand used most by the woman and then to the other hand for 5 min; when the ice started to melt, the ice pack was replaced with a new one. The episiotomies performed were right mediolateral, and repair was performed with number 0 vicryl sutures using the continuous technique in the vagina tissue and number 2/0 vicryl sutures using the separate technique in the skin tissue. Ice massage to the LI4 region of the hand was repeated until the episiotomy repair was finished. The woman's perception of pain before and after the episiotomy repair was measured using the visual analog scale (VAS). The routine practice was carried out with the women in the control group; their pain perception levels were also recorded using the VAS before and after the episiotomy repair.

The sample size was calculated as 320 participants (160 participants for each group) via G*Power 3.1.9.2 with a large effect size, an alpha margin of error of 5% and a power of 95% known in a previous study.[13] Considering the possible losses, 369 women were planned to be included by adding 20%, and the study was finalized with 347 women. According to the randomization schema, 192 women were assigned to the intervention group, while the control group included the remaining 177 women. Toward the end of the study, according to the randomization scheme, while the number of women in the control group was 169 (49.0%), the number of women in the experiment group reached 178 (51.0%). The design of the study is shown in Figure 1.

Women who did not want to continue the ice application and who experienced postpartum bleeding during episiotomy repair, not have any systemic disease or risk associated with pregnancy (such as preeclampsia, oligohydramnios, polyhydramnios, gestational diabetes or placental anomalies) were excluded from the study.

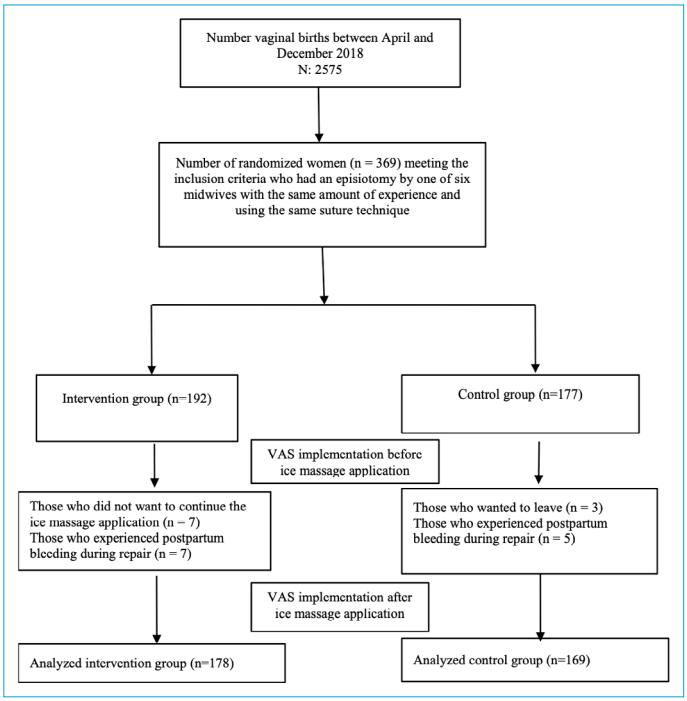

Figure 1. Design of the study.

Socio-Demographic and Obstetric Information Survey Form: The survey consisted of 33 questions, 25 multiple choice and 9 open-ended, prepared by the researchers based on the literature and in line with the aims and objectives of the study. The first nine questions were related to socio-demographic information, 16 questions were related to obstetrics, and the last eight questions related to the duration of the procedure and newborn information.

VAS: A VAS was used to convert some values that cannot be measured numerically into numerical values. Two end definitions of the parameter to be evaluated were written on either end of a line, and the patient was asked to indicate on this line the amount of pain she experienced. One end of the line was rated as "0=no pain," and the other end of the line was rated as "10=worst imaginable pain." The distance from no pain to the point marked by the patient indicates the amount of pain experienced by the patient. The marked pain score is approximately 13 mm of the marked place. To consider the change in pain meaningful, a 30–mm displacement of the scale is required.

The data obtained in the research were transferred to the electronic media and analyzed using the Statistical Package for Social Sciences version 16.0 program. Shapiro–Wilk and Kolmogorov–Smirnov tests were used to determine whether the data showed a normal distribution. Frequency (percentage), mean (standard deviation), and median (minimum-maximum) were used as descriptive statistical methods. Student's t-test and Mann–Whitney U-test were used for continuous variables according to the distribution of variables. In addition, categorical variables were analyzed with the Chi-Square test. A $p<0.05$ value was accepted as significant in all analyses.

RESULTS

A total of 347 women, 178 (51.0%) in the intervention group and 169 (49.0%) in the control group were included in the study. Sociodemographic and obstetric characteristics in the intervention and control groups are summarized in Table 1.

Table 1. Sociodemographic and obstetric characteristics in the intervention and control groups

	Intervention Group (n=178)	Control Group (n=169)	p
Age groups			
20–23 years	80 (44.9)	74 (43.7)	0.493
24–27 years	48 (26.9)	42 (24.8)	
28–31 years	50 (28.2)	53 (31.5)	
Level of education			
Primary education	76 (42.6)	73 (43.1)	0.299
High school	41 (23.0)	23 (13.6)	
University	61 (34.4)	73 (43.3)	
Employment status of mother			
Employed	28 (15.7)	19 (11.2)	0.254
Unemployed	150 (84.3)	152 (88.8)	
Participation in the antenatal class			
Yes	11 (6.1)	4 (2.3)	0.760
No	167 (93.9)	165 (97.7)	
Regular exercise status			
Yes	6 (3.4)	4 (2.3)	0.532
No	172 (97.6)	165 (97.7)	
Number of pregnancies			
1 pregnancy	174 (97.7)	166 (98.2)	0.650
2 pregnancies	4 (2.3)	3 (1.8)	
Miscarriage status			
Yes	4 (2.3)	3 (1.8)	0.650
No	174 (97.7)	166 (98.2)	
Requesting pregnancy			
Yes	153 (85.9)	131 (77.5)	0.034
No	25 (14.1)	38 (22.5)	
Problems in pregnancy			
Yes	57 (32.0)	42 (24.8)	0.151
No	121 (68.0)	127 (75.2)	

Data are presented as n (%).
Chi-square test.

The mean age of the women in the intervention group was 24.6±3.3 years, and the mean age of the women in the control group was 24.8±3.4 years (p=0.110). Birth-related characteristics to the intervention and control groups are summarized in Table 2.

When all women were evaluated, the pre-application VAS was 6.0 (6.0–8.0), and the post-application VAS was 5.0 (5.0–6.0). The perceived pain level to the intervention and control groups after the ice massage during episiotomy repair are summarized in Table 3.

DISCUSSION

In the study, ice massage applied to the LI4 (Hegu) pressure point in the hand, which is a method that can be applied easily in the delivery room, was used. The results showed that ice massage applied to the LI4 during episiotomy repair could significantly reduce the level of pain perceived by women compared to the level of pain perceived by women receiving standard care.

Previous studies have investigated the effects of cold application and ice massage on labour pain and pos-tpartum perineal pain.[14,16-19] These studies provided limited evidence that cold application (such as ice packs and ice gel packs) applied to the perineal region during the second phase of labour and the post-partum period is effective in reducing the pain perceived by women.[18,19] However, no studies have previously been conducted to determine the effect on women's perceived pain level of ice massage applied to the LI4 point on the hand during episiotomy repair.

Table 2. Birth-related characteristics of the intervention and control groups

	Intervention Group (n=178)	Control Group (n=169)	p
Number of pregnancies	1.0±0.1	1.0±0.1	0.360
Weight gained during pregnancy (kg)	10.4±1.6	10.6±1.6	0.112
Gestation week (weeks)	38.9±0.8	39.2±0.8	0.121
Newborn weight (grams)	3321.8±279.4	3168.5±297.0	0.600

Data are presented as mean±standard deviation.
Student t-test.

Table 3. The perceived pain level of the intervention and control groups after the ice massage during episiotomy repair

	Intervention Group (n=178)	Control Group (n=169)	p
Pre-application VAS	6.0 (6.0–7.0)	6.0 (6.0–7.0)	0.530
Post-application VAS	4.0 (4.0–6.0)	5.0 (5.0–6.0)	0.001

VAS: Visual Analog Scale.
Data are presented as median (min-max).
Mann–Whitney U test.

Studies examining the effect of ice massage applied to the LI4 point during the first phase of labour on women's perceived labour pain have shown that ice massage is a non-invasive and safe method that can be used in the management of labour pain.[13-15,17,20] Ice massage shortens the first stage of labour, and its relaxing effect lasts longer than other acupressure techniques.[14,15]

Non-pharmacological methods to reduce pain are mostly used in the first stage of delivery. In previous studies, different analgesic agents were used during episiotomy repair, and the effectiveness of these analgesics was compared.[2,4] Before episiotomy repair, lidocaine is usually applied to the perineal region by injection, and the injection causes secondary trauma in the perineal area. To prevent this secondary trauma, lidocaine-prilocaine cream (EMLA) was applied to the perineal region prior to episiotomy repair, and EMLA was found to provide analgesia equal to a lidocaine injection.[2,4] However, in studies conducted with different local anesthetic agents, it was determined that women's need for pain relief during episiotomy repair could not be completely met by local analgesics.[1,6] Therefore, the use of non-pharmacological methods combined with pharmacological agents was considered. In Shoorab et al., women undergoing episiotomy repair watched a video while wearing virtual reality glasses; the women in the group watching videos felt less pain than the women who did not watch videos.[7] Rezaeyan et al. applied TENS to the He Gu and Shenmen pressure points before the episiotomy was opened and applied lidocaine only to the control group. It was determined that TENS application reduced the pain and perineal edema that women experienced during and after episiotomy repair.[12] In another study, one acupuncture needle was applied to the ears to the participants in one group, while lidocaine was applied to the other group during episiotomy repair; acupuncture was found to the less effective than lidocaine.[11] It was also determined in this study that ice massage, similar to other non-pharmacological agents in the literature, reduces perceived pain during episiotomy repair. The use of nonpharmacological methods during episiotomy repair is a fairly new practice. When these methods are used in the management of labour pain, they both reduce the level of pain perceived by the woman and contribute to her feeling emotionally and physically better. It is thought that the application of these

methods during episiotomy repair will also positively affect women's health.

This study had some limitations. First of all, the results it cannot be generalized to all women in Turkey. Second, this study was conducted to determine the perceived pain level during episiotomy of ice massage to the LI4 point. However, it was not possible to compare it with similar studies since there was no previous study on the subject.

CONCLUSION

Giving birth is a sensitive process that requires close monitoring of both mother's and baby's health. Midwives attach importance to the pain management of women during labor, but after the baby is born, they concentrate on preventing complications and caring for the newborn. In this process, the mother's need for analgesics can be ignored. Non-pharmacological agents are non-invasive, effective, and easy to use. It is thought that the effectiveness of pharmacological agents used during episiotomy repair can be increased with the concurrent use of non-pharmacological methods. However, more comprehensive randomized controlled studies are needed to provide definitive evidence for the effectiveness of these methods.

Disclosures

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: This study was supported within the scope of Ege University BAP (Scientific Research Projects) with project number 17-SBF-008/29.06.2017.

Ethics Committee Approval: This study was approved by the Ministry of Health, the Health Sciences University of Tepecik, the Clinical Research Ethics Committee (Approval date: April 04, 2018, and Approval number: 2018/3-11). The study complied with the guidelines for human studies and should include evidence that the research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. Verbal and written consent was obtained from all participants to carry out the study. The clinical trial registration number is NCT04288388.

Authorship Contributions: Concept – B.A., B.K.S.; Design – B.A., Y.Y., B.K.S.; Supervision –B.K.S., H.Ö.C.; Materials – B.A., Y.Y.; Data collection &/or processing – B.A.; Analysis and/or interpretation – B.A., Y.Y., B.K.S., H.Ö.C.; Literature search – B.A., Y.Y., B.K.S.; Writing – B.A., Y.Y., B.K.S., H.Ö.C.; Critical review – B.A., Y.Y., B.K.S., H.Ö.C.

Acknowledgement: We sincerely thank all the women who participated in the study and the midwives who supported our study for their contribution. Support was received from experts in the Department of Biostatistics at Ege University for the analysis.

The study was presented as an oral presentation at The Current Aspects Of Reproductive Health Congress held on May 5, 2021.

REFERENCES

1. Deshpande JP, Saundattikar GY. Lignocaine versus ropivacaine infiltration for postpartum perineal pain. Anesth Essays Res 2017;11(2):300–3. [CrossRef]
2. Abbas AM, Abdel Hafiz H, Abdelhafez AM, Michael A, Ismail AM. Topical lidocaine-prilocaine cream versus lidocaine infiltration for pain relief during repair of perineal tears after vaginal delivery: randomized clinical trial. J Matern Fetal Neonatal Med 2019;32(13):2182–7. [CrossRef]
3. Franchi MA, Cromi S, Scarperi F, Gaudino G, Siesto G, Ghezzi F. Comparison between lidocaine-prilocaine cream (EMLA) and mepivacaine infiltration for pain relief during perineal repair after childbirth: a randomized trial. Am J Obstet Gynecol 2009;(2):186.e1–5. [CrossRef]
4. Kargar RA, Aghazadeh-Nainie A, Khoddami-Vishteh HR. Comparison of the effects of lidocaine prilocaine cream (emla) and lidocaine injection on reduction of perineal pain during perineum repair in normal vaginal delivery. J Family Reprod Health 2016;10(1):21–6.
5. Steen M, Cummins B. How to repair an episiotomy. Nurs Stand 2016;30(25):36–9.
6. Fyneface-Ogan S, Mato CN, Enyindah CE. Postpartum perineal pain in primiparous women: a comparison of two local anaesthetic agents. Niger J Med 2006;15(1):77–80. [CrossRef]
7. JahaniShoorab N, Zagami SE, Nahvi A, Mazluom SR, Golmakani N, Talebi M, et al. The effect of virtual reality on pain in primiparity women during episiotomy repair: a randomize clinical trial. Iranian journal of medical sciences 2015;40(3):219.
8. Smith CA, Levett KM, Collins CT, Armour M, Dahlen HG, Suganuma M. Relaxation techniques for pain management in labour. Cochrane Database Syst Rev 2018;3:CD009514.
9. Smith CA, Levett KM, Collins CT, Armour M, Dahlen HG, Suganuma M. Massage, reflexology and other manual methods for pain management in labour. Cochrane Database Syst Rev 2018;3(3):CD009290. [CrossRef]
10. Levett KM, Smith CA, Bensoussan A, Dahlen HG. Complementary therapies for labour and birth study: a randomised controlled trial of antenatal integrative medicine for pain management in labour. BMJ Open 2016;6(7):e010691. [CrossRef]
11. Kindberg S, Klunder L, Strom J, Henriksen TB. Ear acupuncture or local anaesthetics as pain relief during postpartum surgical repair: a randomised controlled trial. BJOG 2009;116(4):569–76. [CrossRef]
12. Rezaeyan M, Geranmayeh M, Direkvand-Moghadam A. Comparison of transcutaneous electrical nerve stimulation and lidocaine on episiotomy complication in primiparous women: a randomized clinical trial. Iran J Nurs Midwifery Res 2017;22(1):26–30. [CrossRef]

13. Can HO, Saruhan A. Evaluation of the effects of ice massage applied to large intestine 4 (hegu) on postpartum pain during the active phase of labor. Iran J Nurs Midwifery Res 2015;20(1):129–38.
14. Hajiamini Z, Masoud SN, Ebadi A, Mahboubh A, Matin AA. Comparing the effects of ice massage and acupressure on labor pain reduction. Complement Ther Clin Pract 2012;18(3):169–72. [CrossRef]
15. Yildirim E, Alan S, Gokyildiz S. The effect of ice pressure applied on large intestinal 4 on the labor pain and labor process. Complement Ther Clin Pract 2018;32:25–31. [CrossRef]
16. Oliveira SM, Silva FM, Riesco ML, Latorre MDRD, Nobre MR. Comparison of application times for ice packs used to relieve perineal pain after normal birth: a randomised clinical trial. Journal of clinical nursing 2012;21(23-24):3382–91. [CrossRef]
17. Waters BL, Raisler J. Ice massage for the reduction of labor pain. J Midwifery Womens Health 2003;48(5):317–21.
18. East CE, Begg L, Henshall NE, Marchant PR, Wallace K. Local cooling for relieving pain from perineal trauma sustained during childbirth. Cochrane Database Syst Rev 2012;(5):CD006304. [CrossRef]
19. Francisco A, Smjv De Oliveira A, Steen M, Nobre MRC, De Souza EV. Ice pack induced perineal analgesia after spontaneous vaginal birth: Randomized controlled trial. Women Birth 2018;31(5):e334–e40. [CrossRef]
20. Dehcheshmeh FS, Rafiei H. Complementary and alternative therapies to relieve labor pain: A comparative study between music therapy and Hoku point ice massage. Complement Ther Clin Pract 2015;21(4):229–32. [CrossRef]