



Effect of Ice Gel Pad Application on Early Postpartum Perineal Trauma Outcomes: A Randomized Controlled Trial

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ABSTRACT

Background: Perineal trauma is an injury to the perineum during childbirth. Using cold gel pads as soon as possible during the first twenty-four hours after giving birth will help to promote endorphin production and speed up the healing. **Aim:** To investigate the effect of ice gel pad application on early postpartum perineal trauma outcomes. **Design:** A randomized controlled trial. **Setting:** The postpartum ward at El Fayoum General Hospital. **Participants:** sixty postpartum women with perineal trauma were chosen randomly and allocated into the study group (n = 30) or the control group (n = 30). **Methods:** Four tools were used: A) Structured interview; B) a visual analogue scale for pain severity; C) The visual analogue scale for difficulties with routine activities; D) Standardized REEDA scale. **Results:** At baseline assessment, there was no significant difference between the two groups on the level of perineal pain and REEDA scale parameters. There was a significant difference between the two groups in the degree of perineal pain after 6 hours and 24 hours ($p = 0.000$ and $p = 0.000$, respectively). Additionally, at 24 hours, there was a significant difference between both groups' scores for redness, edema, ecchymosis ($p = 0.001$). **Conclusion:** Early application of ice gel pad on postpartum perineal trauma had a significant effect on decreasing the perineal pain and improving the perineal wound condition during the first 24 hours postpartum. **Recommendations:** Integrating the perineal ice gel pad application as a main part of perineal trauma care during the early postpartum period.

Key Words: perineal trauma, ice gel pad, outcomes, postpartum.

Introduction

Any injury to the perineum during childbirth, whether resulting from an intended surgical incision (episiotomy) or unintentional, is referred to as perineal trauma. Whereas posterior perineal

trauma involves injuries to the posterior vaginal wall, perineal muscles, and anal sphincter, anterior perineal trauma involves injuries to the labia, anterior vaginal wall, urethra, and clitoris and is typically linked with a lower morbidity rate. Most

perineum traumas that occur during childbirth occur on the posterior vaginal wall, which extends to the anus (Sotunsa et al., 2019).

Over 85% of women who give birth normally around the world suffer from perineal trauma, which can take the form of episiotomies, spontaneous perineal tears, or both. Globally, the prevalence of episiotomy varies greatly based on whether the procedure is performed routinely or under certain conditions. Worldwide rates of episiotomies ranged from 27% to 54% for nulliparous women and from 6% to 10% for multiparous women. However, in developing countries like Egypt, between 30% and 50% of women still undergo episiotomies. The incidence of spontaneous tears reduces with repeated births, going from 90.4% for first-birth women to 68.8% for multiparous women delivering normal birth (Ahmed et al., 2022).

Numerous factors have been suggested as potential determinants of perineal trauma, such as ethnicity, especially Asian ethnicity, physical inactivity before pregnancy, and familial risk, all of which have been suggested to be contributing factors to severe perineal trauma. Furthermore, several maternal and fetal factors have been linked to perineal trauma, including nulliparity, maternal age greater than 30 years, maternal birthing position, a prolonged second stage of labor, previous perineal repair scar tissue, operative vaginal delivery, malposition, a large baby (both weight and head circumference), inexperience, and distress of the health-care provider (Bini Solomon et al., 2019).

Short- and long-term physiological, psychological, social, and physical problems can result from perineal trauma. Complications during the first postpartum phase include anal sphincter and urethra damage, dehiscence, discomfort, edema, and redness around the surgical site. Chronic infections, dyspareunia, anorectal dysfunction, fecal incontinence, urine incontinence, or retention are examples of long-term consequences. Women's roles in their home, community, and quality of life are all impacted by these issues, these issues have an impact on women's quality of life, their ability to fulfill their familial responsibilities, and the cost of treating them in the community is high (Vasileva et al., 2019).

The most frequent physical problem linked to perineal injury is perineal pain, which affects 23%–43% of women even 10–12 postpartum days later. Additionally, 7%–10% of women report persistent pain 3–18 months after giving birth. In the third month, 3%–10% of women suffer fecal incontinence, 24% report urinary difficulties, and 23% report surface dyspareunia (Ibrahim et al., 2017; Vasileva et al., 2019).

A number of pharmacological and non-pharmacological interventions have been studied for the treatment of post-vaginal birth perineal trauma. In the past, postpartum therapy for perineal trauma has involved the use of oral analgesics (non-steroidal anti-inflammatory medications) and topical anesthetics (warm and cold sitz baths, 2% lidocaine gel). Many non-pharmacological treatments are now particularly

important for treating perineal injuries because they don't produce systemic side effects like tiredness, irritability, or changes in the composition of breast milk (Eminov et al., 2022).

Early cold therapy (application of an ice pack, gel pad, or crushed ice) is one of the most successful non-pharmacological interventions. This intervention, which helps to reduce inflammation, cellular debris production, edema, hematoma development, spasticity, muscle spindle activity, and nerve transmissions, should be initiated as soon as possible in the early postpartum period. It also increases endorphin release and stimulates the healing process. For a full day following birth, an ice gel pad should be applied to reduce perineal pain (Filipinni et al., 2019).

In a study by Derya et al. (2017) who examined the impact of applying cold to the perineum on pain reduction following vaginal delivery. They found that applying a cold gel pad to the perineum reduced pain and improved postpartum comfort. This is in line with research done by El-Saidy et al. (2018) to examine the impact of applying crushed ice on episiotomy pain and wound healing in postpartum women. The study found that women who applied the crushed ice to their episiotomy in the early postpartum period had better wound healing, lower levels of episiotomy pain, and were better able to carry out daily tasks during the posttest than the control group.

Few studies have evaluated the impact of an ice gel pad on early postpartum pain from perineal

trauma; however, the majority of studies have examined alternative forms of cold administration, such as cold compresses (packs) or crushed ice. According to Cochrane systematic reviews, there is insufficient evidence regarding the effectiveness of this kind of care for perineal trauma, and additional randomized controlled trials are required to support this intervention. Thus, the purpose of this study was to evaluate how early postpartum perineal trauma outcomes were affected by the application of an ice gel pad.

Significance of the study

Many physicians neglect the issue of perineal trauma during the postpartum period. Numerous postpartum physical, social, and psychological complications are common in women who suffer from postpartum perineal trauma. These complications can impact the woman's quality of life, ability to resume her role in the family, ability to function during the postpartum period, and her future choice of delivery method. Under these circumstances, it is imperative to use efficacious measures aimed at expediting the recovery of perineal damage and mitigating the associated pain. The use of perineal ice gel pads as soon as possible after delivery is the most crucial of these measures (Ononuju et al., 2020).

Applications of ice gel pads for perineal trauma offer many advantages, such as being safe, affordable, and suitable for postpartum women in a variety of circumstances. In addition, it lessens perineal pain and speeds up healing. Several randomized controlled trials have been carried out in Egypt in this regard, with inconsistent findings.

Thus, the findings of this research will contribute to the body of knowledge regarding the efficiency of postpartum therapies in promoting the healing of perineal trauma following childbirth.

Aim of this study

This study aimed to test the effect of ice gel pad application on early postpartum perineal trauma outcomes.

Operational Definitions

1. Perineal trauma: In the present study it refers to any injury to the perineum during childbirth, whether resulting from an intended surgical incision (episiotomy) or unintentional as first and second-degree perineal tear.
2. Early postpartum perineal trauma outcomes: In the present study it includes; the degree of perineal pain, perineal wound condition, and postpartum difficulties with routine activities during the first 24 hours postpartum
 - a. Perineal pain: it was assessed after 6 hours and 24 hours postpartum using visual analogue scale for pain intensity (VAS)
 - b. Perineal wound condition: it include the changes in the score of REEDA scale parameters after 24 hours postpartum, and it was assessed using REEDA scale.
 - c. Postpartum difficulties with routine activities: It include difficulties with turning in bed, sitting, getting out of bed, walking, urination, and defecation and it is assessed by the visual analogue scale for difficulties with routine activities

Research hypotheses

Null hypothesis (H₀): There will be no difference in the degree of perineal pain or the condition of perineal trauma between the women in the study group who will apply perineal ice gel pad and the control group who will receive the routine care.

Hypothesis 1: Women with postpartum perineal trauma who will apply an ice gel pad to the perineal trauma will experience a lower degree of perineal pain than those who will receive the routine care.

Hypothesis 2: Women with postpartum perineal trauma who will apply an ice gel pad to the perineal trauma will have a better perineal wound condition than those who will receive routine care.

Outcome measures

Primary outcomes: Degree of perineal pain, perineal wound condition during the first 24 hours postpartum

Secondary outcomes: postpartum difficulties with routine activities such as turning in bed, sitting, getting out of bed, walking, urination, and defecation during the first 24 hours postpartum.

2. Method

2.1. Research Design:

A randomized controlled trial was used to fulfill the study aim.

2.2. Participant:

A convenient sample of sixty postpartum women who had postpartum perineal trauma and a normal spontaneous vaginal delivery were chosen

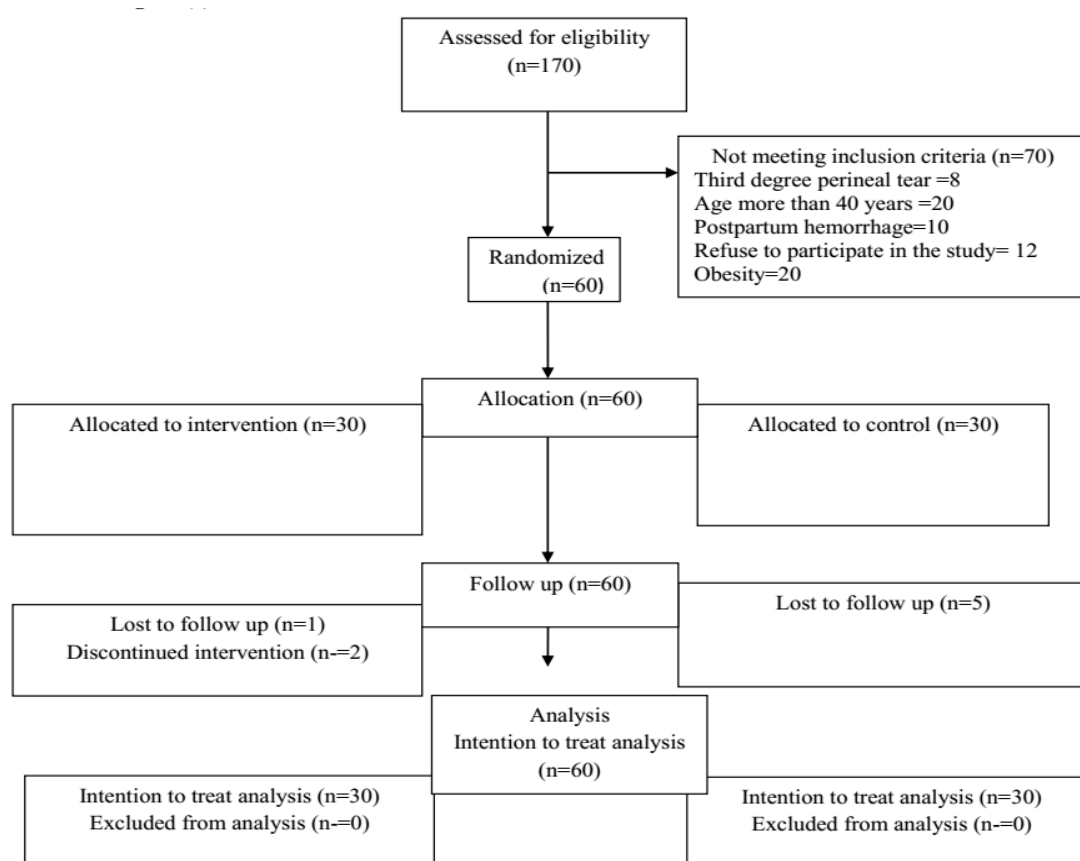
at random and allocated to either the study group (n = 30) or the control group (n = 30). The inclusion criteria for this study were: women who were primiparous or second multiparous and had postpartum perineal trauma (either episiotomy or perineal tear, only first and second degree); they had to be no older than 40 years old; their body mass index (BMI) had to be within a normal range or overweight; they had to be free of any high-risk

conditions that could affect the healing of perineal trauma; they had to be within 37 weeks of gestation; and there should have been no complications during labor or delivery or in the immediate postpartum(period).

2.3. Setting:

The study was carried out at El Fayoum General Hospital's postpartum ward in the obstetrics and gynecology department.

Figure (1)



2.4. Tools used for data collection

2.4.1. A structured interview: This tool was developed by the researcher after reviewing recent related literature, which had two sections; participant demographics, including age, occupation, degree of education, and place of residence, were included in the first section. While,

the participants' type of postpartum perineal trauma (episiotomy or tears), type of episiotomy, and degree of perineal tear (first or second degree tear) were included in the second section.

2.4.2. The Visual Analogue Scale for Pain Severity (VAS). It is a standardized measure that was created by Freyd (1923) to represent an

individual's subjective evaluation of pain intensity. Using a 0–10 number scale, mild pain (< 4), moderate pain (4–8), and severe pain (8–10) respectively. With a test-retest reliability coefficient of $r = 0.62$, the VAS has been demonstrated to be valid and reliable in a number of studies (Derya et al., 2017).

2.4.3. The Visual Analogue Scale for difficulties with routine activities: The tool was modified based on work by Karakaya et al. (2012). A horizontal 10 cm visual analogue scale was used six times to measure the degree of difficulty associated with each of the daily regular activities, which as turning in bed, sitting, getting out of bed, walking, urination, and defecation. The overall score (0–60 points). A total score of 0 meant no difficulties, 1 to < 24 meant mild difficulties, 24 to < 48 meant moderate difficulties, and 48 to 60 meant severe difficulties. A test-retest reliability coefficient of $r = 0.82$ indicates that this instrument is genuine and dependable (Karakaya et al., 2012).

2.4.4. The REEDA scale: The REEDA scale was taken from Davidson (1974). Its purpose was to evaluate the state of perineal trauma. This descriptive scale evaluates five characteristics of the healing process following perineal trauma: redness, oedema, echymosis, discharge, and suture approximation. It has a four-point category score (0–3). A poor wound healing process is indicated by a higher score for each parameter. The test-retest reliability coefficient of $r = 0.70$ indicates that this tool is valid and reliable (Farrag et al., 2016).

Validity and Reliability

Unstandardized tools were submitted to three experts in the field of maternity nursing to test content validity, clarity of sentences, and appropriateness of content. Modifications were carried out according to the expert's judgment before seeking the approval of the ethical committee.

2.5. Procedure

The duration of data collection was seven months, starting in January 2023 and concluding in August 2023. To gather the information for this study, the researcher spent with each woman about six to seven hours. Five phases were used in each group to collect data: randomization, interviewing and initial assessment; intervention; follow-up.

2.5.1. Randomization (random sample and random allocation): The researcher recruited women who met the inclusion criteria, and a random sample was chosen from them using a random number by a third party who was not involved in the study. Subsequently, the women were allocated randomly to either the study or control group. To ensure concealment, a sealed opaque envelope prepared by the assistant researcher was used, and every woman chose an envelope according to her group affiliation (control or study).

2.5.2. Interviewing and initial assessment: Interviewing and preliminary evaluation: After explaining the purpose of the study, information

about the sociodemographic status and obstetric history of both groups was gathered. Then, an initial assessment was conducted for the women in both groups to gather information on the type of perineal trauma, the severity of perineal pain, and the condition of perineal trauma (REEDA scale score).

5.5.3. Intervention:

During the first twenty-four hours after birth, the study group applied an ice gel pad to perineal injuries for 20 minutes every two hours. All of the ice gel pads have the same standardized diameter, which is roughly 5 cm in width, 1.5 cm in thickness, and 23 cm in length. It was taken out of the freezer after 45 to 60 minutes. It was then rapped on a sterile pad and then applied to the perineal trauma. The pad was appropriate for the perineal region's anatomical nature and were certified by the Egyptian Ministry of Health.

The women in the study group were instructed to apply only the perineal ice gel pad during the first 24 hours postpartum (no routine care was received) and investigator gave brief, precise directions both orally and in writing regarding the following: 1) the goal, advantages, expected outcomes, and application instructions for the ice gel pad; 2) Within 30 to 60 minutes of giving delivery, apply the ice gel pad to the perineum; 3) tell the women to use the ice gel pad for 20 minutes every two hours for the first 24 hours after giving birth; and 4) to avoid infection, replace the perineal pad every two hours. Each woman needed between thirty and forty minutes for this session. While the control group was given

only routine hospital care, which comprised one tablet of Cataflam analgesics every eight hours, 500 mg of Flagel every eight hours, and one gram of antibiotics (Hibiotic) every twelve hours.

5.5.4. Follow-up: A follow-up was conducted after six and twenty-four hours. The visual analog scale for pain intensity (VAS) was used to measure the degree of perineal pain after six hours and after twenty-four hours. The standardized REEDA scale was used to measure the condition of the perineal wound after 24 hours. The Visual Analogue Scale (VAS), which rates regular activities, was also used to evaluate women's postpartum difficulties with turning over in bed, getting out of bed, sitting, walking, defecating, and urinating.

2.6. Ethical consideration

The study was granted approval by the El Fayoum University faculty of medicine's research ethics committee. Furthermore, women who expressed a desire for participating part in the study provided written informed consent following confirmation that there was no risk or hazard associated with the study's conduct.

2.7. Statistical Analysis

Statistics that were used to present mean, standard deviation (SD), median, and range were used when appropriate. Frequencies, or the number of occurrences, were also used. The numerical variables were compared between the two groups using a t test for independent samples. To compare categorical data, the chi-square test was used. Statistics were performed using two-sided p values less than 0.05 to assess statistical significance. IBM SPSS version 22 for Microsoft Windows

(Statistical Package for the Social Sciences; IBM Corp., Armonk, NY, USA) was used for all statistical calculations.

3. Results

3.1. Demographic characteristics

Regarding the socioeconomic characteristics of the two groups, there was no significant difference between them. With mean ages of 25.63 ± 5.78 and 24.96 ± 4.75 years, respectively, the study and control groups did not differ significantly from one another ($X^2 = 2.044$, $p = 0.360$). Additionally, 33.3% of the study group and the control group had completed secondary education with no statistically significant differences between the two groups ($X^2 = 8.956$ and $p = 0.062$). The majority of the women in the two groups were housewives (93.3% and 86.7%, respectively) with no significant differences between them ($X^2 = 0.741$ and $P = 0.389$), with. About 73.3% of the study group's women living in urban regions compared to 70% of the control groups with no significant differences between the two groups ($X^2 = 0.190$). Table (1)

Regarding the type of perineal trauma, there were no significant differences between the two groups ($X^2 = 0.352$, $p = 0.839$). While 3.3% and 6.6% of the study and control groups, respectively, had perineal tears only, about 93.3% and 90% of the women in the study group and the control group, respectively, had episiotomies only. Furthermore, about 96.7% of the study group and 96.7% of the control group, respectively, experienced mediolateral episiotomy. Table 2

3.2. Primary outcomes

3.2.1. Postpartum perineal pain

The degree of postpartum perineal pain did not significantly differ between the two groups at the baseline assessment ($X^2 = 0.073$, $p = 0.878$). However, after using cold gel pads for six hours, none of the study group experienced severe pain, in contrast to approximately fifty percent of the control group. Additionally, about 60% and 46.7, respectively, of the two groups reported moderate pain, with a highly significant difference ($X^2 = 24.808$ and $p = 0.001$) between the two groups. Furthermore, 63.3% of the study group and 3.3% of the control group experienced mild pain after a 24-hour postpartum period, with a highly significant difference between the two groups ($X^2 = 29.827$, $p = 0.001$). After a 24-hour period, the relative risk (RR) for perineal pain is .37, 95% CI 0.235 to 0.609.(table 3)

3.2.2. Perineal wound condition

Table 4 illustrates that, at baseline, there was not a significant difference in the perineal wound condition between the two groups, with both groups scoring approximately similarly on all REEDA scale parameters (Figure 1). However, following a 24-hour application of ice gel pads among the study group, the parameters of redness, edema, echymosis, and approximation of sutures showed a significant difference between the two groups ($p = 0.001$), while the approximation of sutures showed no significant difference ($p = .197$) (Figure 2).

3.3. Secondary outcomes

3.3.1. Difficulty with routine activities

After 24 hours postpartum, there was a significant difference ($P = 0.001$) between the

study and control groups for difficulty with routine activities; the study group experienced less difficulty with functional activity than the control group (Table 5).

Table (1) Socio-demographic characteristics of women among the study and the control groups.

Items	Study group (n= 30)		Control group (n= 30)		χ^2	p-value
	%	No	%	No		
Age(years)						
18-20	7	23.3%	7	23.3%	2.044	0.360
21- 30	16	53.4%	20	66.7%		
31- 40	7	23.3%	3	10%		
Mean± SD	25.63±5.78		24.96±4.75			
Education level						
1- Read &Write	6	20%	4	13.3%	8.956	0.062
2- Primary School	1	3.3%	8	26.7%		
3- Preparatory School	9	30%	3	10%		
4- Secondary School	10	33.3%	10	33.3%		
5-University School	4	13.3%	5	16.7%		
Occupation						
Housewife	28	93.3%	26	86.7%	0.741	0.389
Working	2	6.7%	4	13.3%		
Residence						
Rural	8	26.7%	9	30%	.082	0.774
Urban	22	73.3%	21	70%		

Significant at p-value <0.05.

Table (2) Distribution of the mothers in both groups related to type of perineal trauma and body mass index (BMI).

Item	Study group (n= 50)		Control group (n= 50)		χ^2	p-value
	No	%	No	%		
Type of perineal trauma						
Episiotomy	28	93.3%	27	90%	0.352	0.839
Perineal tear	1	3.3%	2	6.6%		
Both	1	3.3%	1	3.3%		
Type of episiotomy						
Median	1	3.3%	4	13.3%	1.964	.161
Mediolateral	29	96.7%	26	86.7%		
BMI						
Normal	19	63.3%	20	66.7%	.073	.787
Overweight	11	36.7%	10	33.3%		

Significant at p-value <0.05

Table (3) Distribution of mothers among study and control groups according to severity of perineal pain among the study and control group before and after intervention.

Items	baseline assessment		6 hours later		After 24 hours	
	Study group	Control group	Study group	Control group	Study group	Control group
Perineal pain	N	%	N	%	N	%
Mild pain	0 (0%)	0 (0%)	12 (40%)	1 (3.3%)	19 (63.3%)	1 (3.3%)
Moderate pain	10(33.3%)	11(36.7%)	18 (60%)	14 (46.7%)	10 (33.3%)	13 (43.3%)
Severe pain	20(66.7%)	19 (63.3%)	0 (0%)	15 (50%)	1 (3.3%)	16 (53.3%)
χ^2	.073		24.808		29.827	
P value	0.878		0.001		0.001	

Significant at p-value <0.05.

Table (4) Comparison of mean score for REEDA parameters score among study and control group before and after intervention.

Items	study group n=50		control group n=50		<i>t</i>	p-value	95%CI	
	M	SD	M	SD			Lower	Upper
REEDA parameters score at:								
baseline assessment								
Redness	2.63±.490		2.76± .504		-1.039	.303	-.390	.123
Edema	2.66±.479		2.70±.466		-.273	.786	-.277	.211
Echymosis	2.40±.674		2.56±.568		-1.035	.305	-.489	.155
Discharge	.833±.592		.733±.449		.737	.464	-.171	.371
Approximation of sutures	.700±.466		.500±.508		1.588	.118	-.052	.452
24 hours after intervention								
Redness	1.76±.504		2.70±.534		-6.955	.001	-1.201	-.664
Edema	1.56±.568		2.70±.466		-8.446	.001	-1.401	-.864
Echymosis	2.00±.643		2.56±.568		-3.616	.001	-.880	-.252
Discharge	.300±.466		.733±.449		-3.664	.001	-.670	-.196
Approximation of sutures	.666±.479		.500±.508		1.306	.197	-.088	-.422

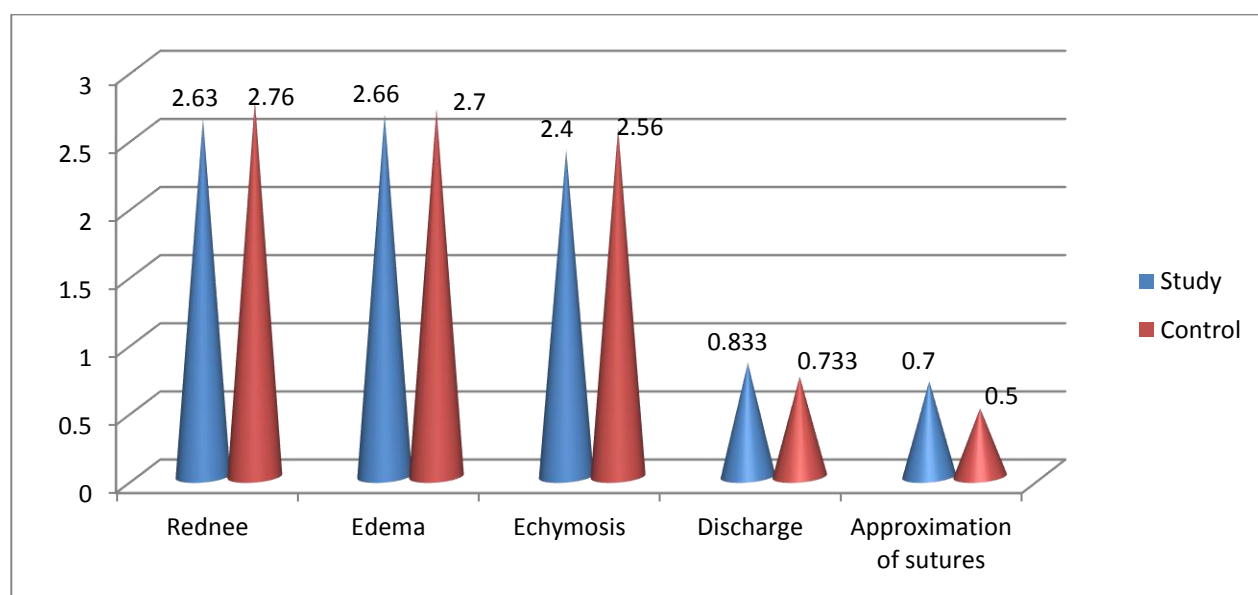


Figure 1 Comparison of REEDA parameters score among study and control group before intervention.

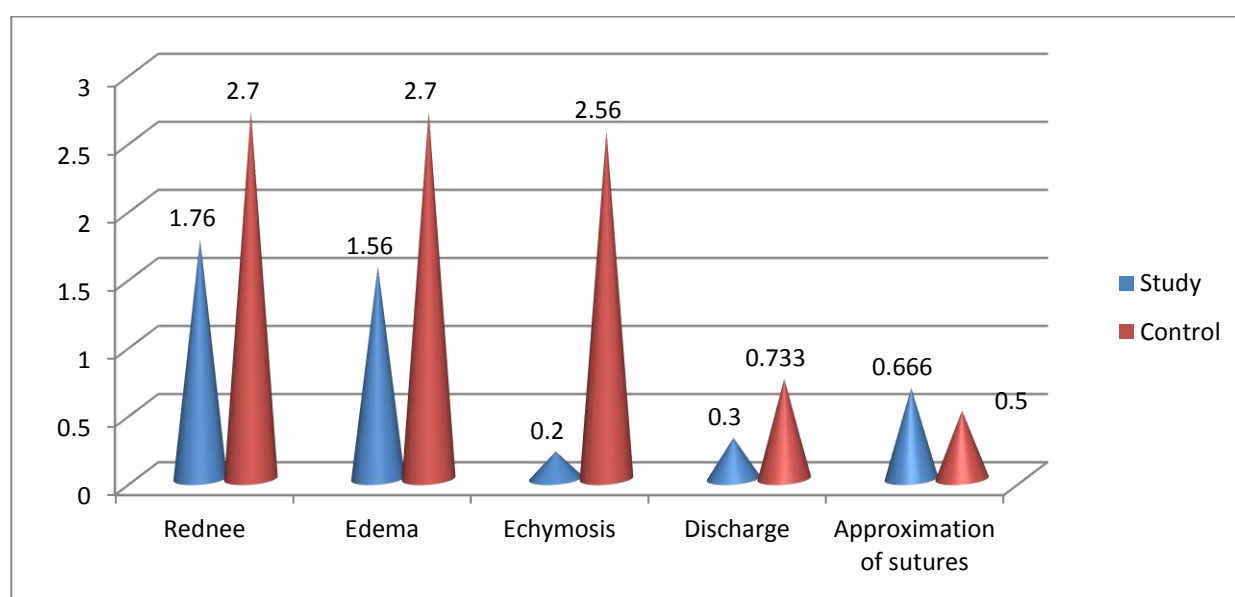


Figure 2 Comparison of REEDA parameters score among study and control group 24 hours post intervention.

Table (5) Distribution of mothers among study and control groups according to the difficulty with routine activities.

Items	Study group		Control group		χ^2	P value
	N	%	N	%		
Functional activity						
Mild difficulty	3	(10%)	0	(0%)	26.225	0.001
Moderate difficulty	25	(83.3%)	9	(30%)		
Severe difficulty	2	(6.7%)	21	(70%)		

Significant at p-value <0.05.

4. Discussion

The results of this study reject the null hypothesis and confirmed the research hypothesis 1, which states that women with postpartum perineal trauma who will apply an ice gel pad to perineal trauma will experience a lower degree of perineal pain than those who will receive routine care. As well as the research hypothesis 2 that women with postpartum perineal trauma who will apply an ice gel pad to perineal trauma will have better perineal wound conditions than those who will receive routine care.

According to the current study, there were highly statistically significant differences between the two groups at 6 and 24 hours postpartum in relation to the level of perineal pain ($p < 0.05$ and $p < 0.05$), respectively, indicating that the women in the study group who applied the ice gel pad for the first 24 hours postpartum had less postpartum perineal pain than the control group.

These outcomes are in line with the findings of Kirca et al.'s systematic review and meta-analysis from 2021 about the impact of cold therapy on episiotomy pain. Seven published trials totaling 700 participants were considered in this systematic review. The studies used different cold application techniques (cold gel pack/pad, crushed ice gel pad, ice pack) to relieve postpartum perineal pain following episiotomy. At various assessment times, all the included trials demonstrated a significant ($p < 0.05$) reduction in perineal pain following application of a perineal cold gel pad

Moreover, these results have been supported by Kridsana et al. (2020) systematic review on the

efficacy of cold compression in treating postpartum perineal trauma. Of the three modes of cold application (ice, cold packs, and cold sanitary napkins), mothers found cold packs to be much more acceptable than ice. They also indicated that postpartum perineal pain was greatly alleviated by perineal cold compression.

El-Saidy et al. (2018), who investigated the impact of putting crushed ice gel pads on the perineum on episiotomy pain and wound healing among postpartum primiparous women, confirm these findings. Their study involved 200 primiparous mothers and was carried out in Egypt. The first two hours following delivery served as a baseline, and the first day and three days postpartum were used to measure the severity of perineal pain. According to the study, most of the women in both the study and control groups experienced severe pain at the time of the initial assessment; less than one-third of the study group's participants reported having severe pain 12 hours after the intervention, compared to approximately half of the control group's participants, with statistically significant differences between the two groups ($p < .05$).

Furthermore, Shehta et al. (2017) provided more evidence for these findings with their research about the impact of cold gel packing on episiotomy pain in postpartum mothers. They found that there was a statistically significant difference in the perineal pain relief experienced by the study group applying a cold gel pack compared to the control group receiving routine care. In order to improve episiotomy pain

management, they advised maternity nurses to raise awareness among others in the profession about the importance of applying a cold gel pack to the episiotomy incision as soon as possible after delivery.

Another systematic review on the use of local cooling to relieve pain from perineal injuries incurred after labor, carried out by East et al. (2020), does not, however, support these findings. They reported that the use of cooling treatments, such as ice packs or cold gel pads, for the relief of perineal pain in the first two days after childbirth was found to be supported by very little, low-certainty evidence. They also suggested that further, well-planned trials be carried out and that the ongoing lack of reliable evidence supporting the advantages of cooling treatments be taken cautiously.

The study group's notable reduction in perineal pain during the first 24 hours postpartum may be explained by the gate control theory for pain perception following cold application. This is because cold application inhibits inflammation and stimulates A-beta fibers, which in turn activate inhibitory neurons and increase endorphin release, thereby reducing the release of chemical mediators. According to Setyawati et al. (2019), they modify pain transmission to lessen pain perception by reducing the transmission of pain impulses through A-delta fibers and C nerve fibers (closing the gate) in the spinal cord.

Furthermore, the current research demonstrated that following a 24-hour application of perineal ice gel pads, there was a statistically

significant difference in the mean score of the REEDA parameters (redness, edema, and echymosis) between the study and control groups. Discharge and approximate suture size, on the other hand, did not significantly differ from one another. Ahmed et al. (2023) supports these findings, stating that hematoma and redness scores were considerably lower in the gel pad group than in the control group following a twelve-hour administration of a perineal cold gel pad.

Eminov et al. (2022) found that applying lavender oil instead of ice had a similar effect on women's satisfaction and the healing of episiotomy wounds. According to the study, there was a statistically significant difference in the mean score of REEDA parameters at 24 hours and on the seventh postpartum day between the ice group and the control group, as well as between the lavender oil group and the control group, following the application of an intervention at the immediate postpartum.

These results, however, are in disagreement with those of Morais et al. (2016), who examined the management of perineal trauma following vaginal delivery using cryotherapy and discovered no distinction in perineal edema and redness between women in the cooling group and those in the placebo group when measured four to six hours or within 24 hours of giving birth. Furthermore, a study by Amani et al. (2015) that compared the impact of topical olive oil versus gel packs on episiotomy wound healing does not support these findings. They reported that perineal olive oil treatment was found to be more beneficial for

episiotomy wound healing, as the study found that the topical olive oil group had a lower REEDA score and better episiotomy wound healing than the ice pack group at posttests.

The considerable reduction in mean scores of REEDA scale parameters may be related to is the use of perineal cold gel pads. Because after perineal injury, there will be swelling or edema as a result of the dilated peripheral blood vessels and the greater permeability. Therefore, applying ice to the skin slows blood flow to the area, which lessens bruises, localized pain, and swelling and bleeding of the tissue. Consequently, early cold therapy application to the perineum following delivery aids in reducing inflammation, cellular debris creation, edema, and hematoma development. It also slows down bacterial growth, promoting faster healing of the perineal wound.

Also, the study group experienced less difficulty with routine activities than the control group, according to this study. These results are consistent with those of Senol et al. (2017), who found that all of the women's postpartum comfort was improved, and pain related to routine activities like sitting, walking, lying down, caring for an infant, and urinating was reduced when a cold gel pad was applied to the perineum.

The lower difficulty with routine activities among the study group may be related to the application of ice gel pad to perineal trauma, as it helped in the alleviation of perineal pain and improving the wound condition. This results in increasing the comfort level and decreasing the difficulty with activities such as with turning or

rolling in bed, getting out of bed, sitting, walking, defecation, and urination.

5. Conclusion

Early application of ice gel pad on postpartum perineal trauma had a significant effect on decreasing the perineal pain and improving the perineal wound condition during the first 24 hours postpartum.

6. Recommendations

Based on the findings of this study, the following are recommended:

1. More studies with more sample size are needed to establish standardized evidence.
2. After establishing standardized evidence, it is recommended to integrate the perineal ice gel pad application as a main part of perineal trauma care during the early postpartum period.
3. Raise women's awareness regarding the importance of postpartum perineal trauma care to avoid wound infection.
4. Raise the awareness of health care providers regarding the importance and effectiveness of the ice gel pad application for the management of perineal trauma pain and enhancing wound healing.

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