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Comparison of the effect of ice massage in the LI4 and SP6 on Primary Dysmenorrhea: A blinded clinical trial

Zeinab Younes Barani✉, Maryam Shahraki

Background and purpose: **The purpose of this study was to compare the effect of ice massage in Hugo point and spleen point 6 on the severity of primary dysmenorrhea in students.** ***Methods:*** **This study was counducted on 90 female students residing in dorms. The instruments used in this study were Visual Analog Scale (VAS) for pain and a watch.** ***Results:*** **The mean of pain intensity in the two groups of ice massage on the Hugo point and ice massage on spleen point 6 was significantly reduced after the intervention (P<0.05).** ***Conclusion:*** **According to the results of this study, ice massage on the Hugo point and spleen point 6 significantly decreased the pain intensity in the primary dysmenorrhea.**

INTRODUCTION

The prevalence of dysmenorrhea in adolescents and young adults is estimated to be between 34% and 94% (1). At reproductive age, 10% of women become incapable of work for 1-3 days per month due to intense dysmenorrhea (2-4). From a clinical point of view, dysmenorrhea is often divided into two broad groups: primary and secondary (4). The pain in the primary dysmenorrhea can be mild or extremely intense. It is usually more intense on the first day of menstruation and then gradually decreases. It has a crampy or colic quality similar to labor pain which is felt in the lower abdomen in the middle line and sometimes spreads to the back or upper part of the thighs. Abdominal pain is often accompanied by nausea and sometimes vomiting, diarrhea, fatigue, general feeling of weakness, headache and back pain. The pathophysiology of primary dysmenorrhea is not completely determined; nevertheless, one of its most accepted causes is prostaglandins and other inflammatory factors, such as Leukotriene released from the endometrium during the menstruation (3, 5). Different methods are used to control menstrual pain today, which are mainly divided into two categories of medical and non-medical techniques. Nonsteroidal anti-inflammatory drugs, oral hormonal medications and other analgesics are among the medical treatments (6). Although these drugs have quick effects, their long-term use can cause problems such as nausea, digestive problems, peptic ulcer and diarrhea (7). Also, these drugs are not useful in 10-20% of patients (4). For this reason, in recent years, non-medical treatments such as massage therapy, therapeutic touch, hydrotherapy, music therapy, heat therapy and cryotherapy, which are known as complementary therapies, have attracted the attention of patients. These methods are simple, inexpensive and non-invasive and have no side effects (8, 9). Acupressure is the massage of acupuncture points, which uses fingers, elbows or ice massage to stimulate the pressure points and balance of energy in the body, and does not require needles, medications, or any other special means(10). Accordingly, there are certain points in the body that represent a specific organ or function of the body. These points include the Hugo point (LI4) and the spleen point 6 (SP6). The large intestine or Hugo point (LI4) is the most important pain reliever point in the body (11, 12). Massage, improving blood flow and lymph, in addition to reducing muscle stiffness, prevents stagnation of the interstitial fluid, which in turn results in accelerated blood and lymph purification, which increases the level of oxygen in the blood and provides more oxygen and nutrients for the cells (13, 14). In a study, Melzak found that intense sensory impulses from ice massage at the Hugo point led to 50% reduction in teeth pain (15). Also, Rakhsh Khorshid et al. (2013) in a study titled *A Comparison of the Effect of Massage and Ice Massage in SP6 on the Severity and Duration of Primary Dysmenorrhea* concluded that the use of acupressure at SP6 with or without ice reduced the severity and duration of primary dysmenorrheal pain (16).

Considering the above mentioned cases and the necessity of this study due to the increasing number of employed women in the society and the high prevalence of primary dysmenorrhea and its complications including disability and inefficiency in daily activities, the present study aims to compare the effect of ice massage in the Hugo point and spleen point 6 on the severity of primary dysmenorrhea in students of Zabol University of Medical Sciences in 2017.

METHOD

Design and Registration

This is a blinded clinical trial study with a control group which was conducted on 90 female students in Zabol University of Medical Sciences during December 2017 to April 2018. Sampling method was a simple random assignment in three groups of ice massage on Hugo point, ice massage on spleen point 6 and control group. The number of

Midwifery Department, Nursing and Midwifery School, Zabol University of Medical Science, Zabol, Iran;
✉*Corresponding author*: Zeinab Younes Barani, Midwifery Department, Nursing and Midwifery School, Zabol University of Medical Science, Zabol, Iran; Email: ganjresearch@gmail.com

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participants in each group was 30, and a total of 90 participants were studied.

Participants

Participants were included female students based on the inclusion criteria. The inclusion criteria were painful menstruation in most menstrual cycles over the past year, pain score higher than 4 based on visual Analog Scale for Pain (VAS Pain), (17), age group of 18-28 years old, regular menstruation (3-7 days menstruation and a 21 to 35 days interval between two menstruations), no history of uterine and pelvic disorders, no pregnancy, no use of oral contraceptives, no history of abdominal or pelvic surgery. Exclusion criteria were smoking in the last six months, professional exercise in the last six months, intense stressors in the last six months, death of first-degree family members, separation of parents, non-occurrence of menstruation, using analgesics more than two times during the study, use of heat therapy and cryotherapy, use of herbal medicines to reduce menstrual pain and using massage techniques except for the understudy technique. Sampling method was stratified random method. Then, patients were allocated into three groups by random block allocation method.

Intervention

Participant with inclusion conditions were enrolled in the study. Before the intervention, a form was distributed among the participants to register the onset, end and severity of their menstrual pain during the first three days of menstrual bleeding; then they were asked to return the form to the researcher. In the second stage, three to five days before menstruation, the researcher used 2 cm diameter circular ice pieces that were placed inside plastic bags and covered with a thin gauze to prevent moisture transmission and direct ice contact with the skin to apply ice massage. Massage with ice was carried out rotationally for 1 minute (30 seconds clockwise and 30 seconds counterclockwise) in one group on the Hugo point and in the second group on the spleen point 6, and then pressure was not applied for 10 seconds. Duration of intervention in both groups was 20 minutes and daily intervention was performed in the free time of the participants. In the control group, the procedure was exactly the same as that of the intervention group except for that the ice massage in the control group was performed on other spots. With the onset of bleeding, intervention was stopped in both control and intervention groups and a form was distributed to participants to record their pain severity during the first three days. VAS was used to record pain (Figure 1).

Ethical Considerations

Before the intervention, patients were asked for oral and written consent for participation in the study. This study was approved by the Ethics Committee of Zabol University of Medical Sciences and the Ethics Committee of the place where research was conducted (Ethic code: Zbmu.1.REC.1396.310). Clinical trial was approved by Iranian Registry of Clinical Trials (IRCT) under NO: IRCT20180329039156N1. The CONSORT checklist was used to report the study (18).

Data Analysis

Data were analyzed using SPSS-22 and descriptive and inferential tests at significance level of $P < 0.05$.

RESULTS

The total number of participants in the study was 90 and 30 participants were assigned to each of three groups: control group, the group of ice massage on the Hugo point and the group of ice massage on spleen point 6. The mean age of the participants in the control group was 21.90 ± 1.27, in the group of ice massage on the Hugo point was 22.23 ± 3.06 and in the group of ice massage on the spleen point 6 was 22.64 ± 2.87 years. The results of ANOVA test showed that the mean age of the participants in the different groups did not differ significantly ($P = 0.31$). The results of Wilcoxon test showed that the mean of pain intensity before and after the intervention in the control group was not significantly different ($P = 0.24$); however, the mean pain intensity in the group of ice massage on the Hugo point as well as in the group of ice massage on the spleen point 6 after the intervention significantly decreased compared to mean pain intensity before intervention ($P<0.001$), (Table 1).

The results of Kruskal-Wallis test showed that the mean pain intensity before intervention in the three groups of control, ice massage on Hugo point and ice massage on spleen point 6 was not significantly different ($P = 0.63$); nonetheless, the mean pain intensity after intervention in the three groups showed a significant difference ($P <0.05$). The result of the Mann-Whitney U test showed that the mean pain intensity in the groups of ice massage on the Hugo point and the ice massage on spleen point 6 was significantly lower than that of the control group, but there was no significant difference between the two groups of ice massage on the Hugo point and ice massage on spleen point 6. The mean of pain intensity changes in the three groups was significantly different ($P <0.001$). Based on the results of the Mann-Whitney U test, mean of pain intensity changes in the groups of ice massage on the Hugo and ice massage on spleen point 6 compared to the control group was significantly lower and the mean of pain intensity changes in the group of ice massage on the Hugo point relative to the group of ice massage on the spleen point 6 was also significantly lower (Table 1).

The results also showed that the mean score of satisfaction in two groups of ice massage on the Hugo point and ice massage on spleen point 6 was significantly higher than that of the control group ($P <0.001$); however, the mean score of satisfaction in the group of ice massage on the Hugo point (3.44±0.36) and the group of ice massage on spleen point 6 (3.52±0.46) did not show any significant difference ($P=0.67$).

DISCUSSION

The results of this study showed that the use of ice massage on LI4 and SP6 points caused a significant reduction in the severity of primary dysmenorrhea in the intervention groups compared to the control group.

The results of this study are consistent with other studies in this area. For example, Rakhsh Khorshid et al. (2013) in a study to compare the effect of massage and ice massage at SP6 on the severity and duration of primary dysmenorrhea concluded that the use of acupressure at SP6 with or without ice significantly reduced the severity and duration of primary dysmenorrhea in the intervention group compared to the control group (16). Another study by Shahdadi et al., showed that ice massage as a non-invasive, simple and inexpensive method with no side effect, considering the possibility of teaching it in the shortest possible time, can be used to relieve primary menstrual pain (19), which is consistent with the results of this study. In a study by Kaviani et al, it was concluded that both acupressure and ice massage techniques reduced pain severity, duration of labor stages and anxiety level in primipara women; however, the effect of ice massage was higher (20). In a study, Melzak examined the effect of ice massage at the LI4 point on toothache in 40 outpatients referring to the dental clinic in Montreal and concluded

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Figure 1. Flow Diagram of study

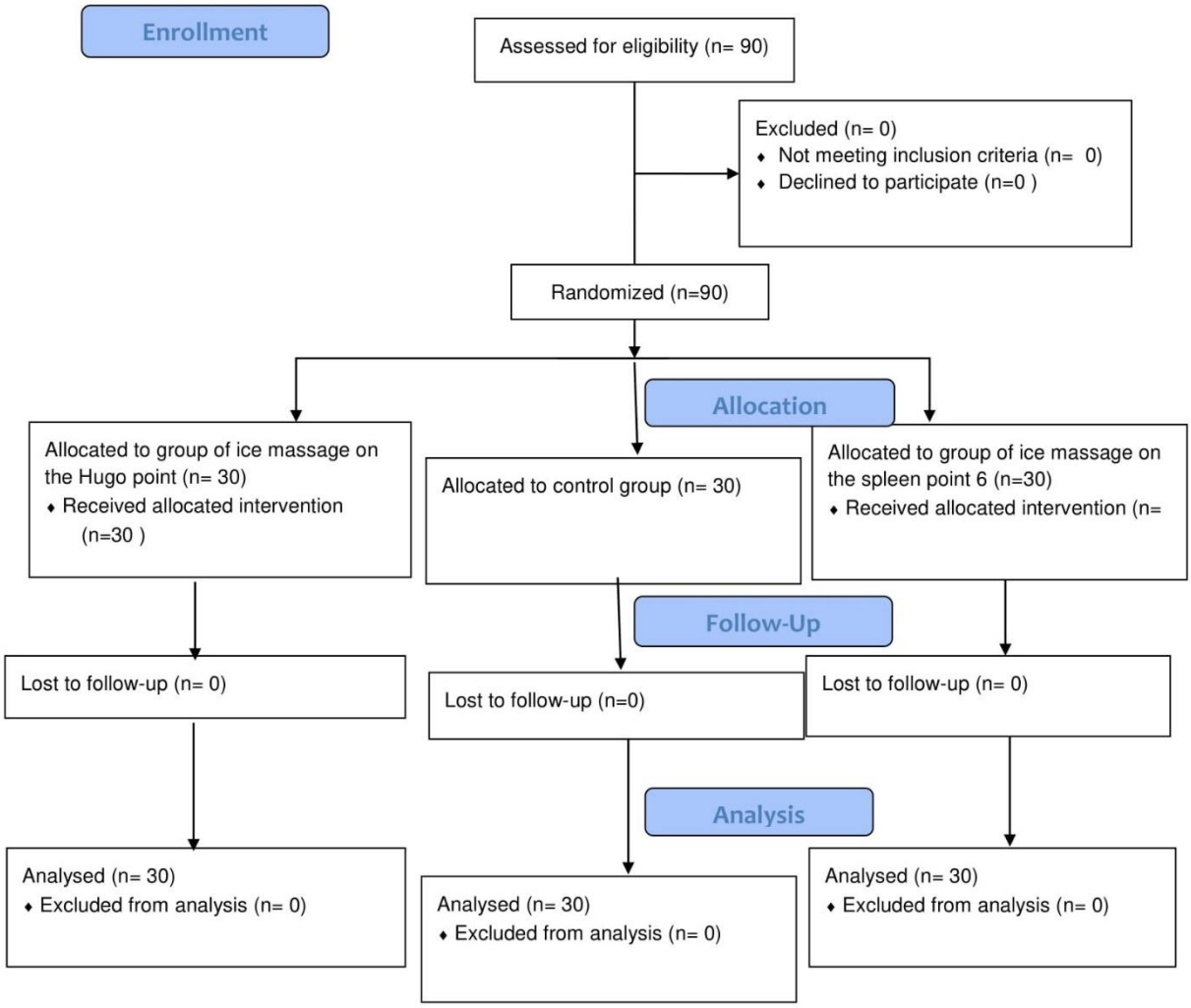

Table 1 A Comparison of Mean and Mean of Changes in Pain Intensity in the Three Control Groups, Ice Massage on LI4 and Ice Massage on SP6

Intervention Time	Pain Intensity			P-value
	Control Group (Mean ± SD)	Group of Ice Massage on the Hugo Point (Mean ± SD)	Group of Ice Massage on Spleen Point 6 (Mean ± SD)	
Before Intervention	2.31±1.22	2.75±1.65	2.09±1.02	0.63
After Intervention	2.39±1.11	2.13±0.98	1.58±1.18	0.01
P-value	0.24	<0.001	<0.001	-
Changes of Mean	0.07±0.75	0.68±0.83	1.35±0.97	0.001

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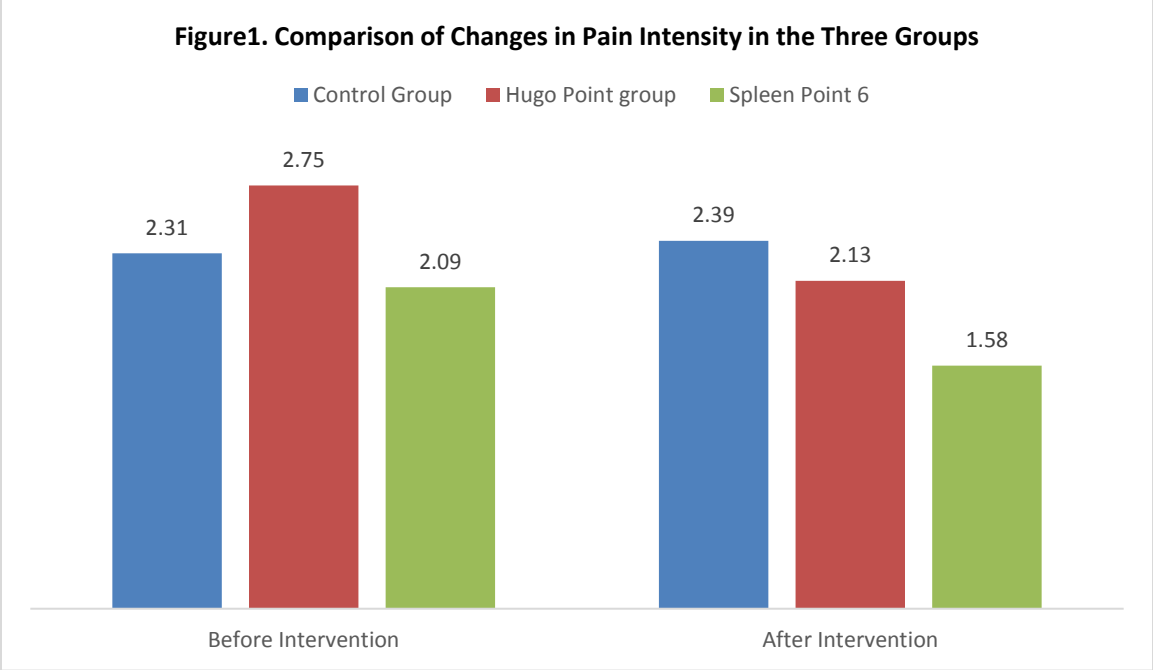

that performing massage and ice massage on the LI4 point caused a significant reduction in intensity of toothache in the participants; however, this reduction in pain intensity in the ice massage group was greater compared to the massage group (15). Anjezab et al. (2007) found that ice massage at the LI4 point caused a significant reduction in labor pain, such that there was a significant difference between the pain severity after intervention in the two (ice massage and control) groups (21), and findings of their study are consistent with the results of this study. Also, the results of the present study showed that the effect of ice massage at SP6 on decreasing pain intensity was more than that of ice massage at LI4 point and this difference was statistically significant. Wang studied the effect of massage at SP6 on the pain caused by primary dysmenorrhea in both the experimental and control groups. The results showed a significant decrease in the pain intensity after the intervention in the experimental group compared to pain intensity before intervention (22). Research by Waters et al. showed that ice massage at the LI4 point (the area between the thumb and index finger) is an effective way of controlling pain of mother during the first stage of labor (23).

The other result of this study is that the mean score of satisfaction for ice massage at the LI4 point and ice massage at the SP6 was significantly higher than that of the control group; however, the effect of the two groups of ice massage at the LI4 point and ice massage at SP6 was not statistically different. These results are consistent with the findings of Kazimzadeh (24). Kazimzadeh studied the effect of acupressure at the LI4 point on the satisfaction of labor in women referring to Fatemiyeh Hospital of Shahroud and concluded that the satisfaction level in the intervention and control groups was significantly different and participants in the intervention group had the highest score of satisfaction with their treatment (25).

CONCLUSION

The ice massage method that is very simple, inexpensive, easily-available and safe with no side effects can be performed by any caregiver and is a suitable option for reducing the pain of primary dysmenorrhea. Also, the use of this method is recommended especially for those people whom the use of analgesics is harmful to them, those who are suffering from the side effects of these drugs and whose people who are reluctant to take the drugs. According to the results of this study, the use of ice massage at Hugo point and spleen point 6 significantly reduced the severity of pain of primary dysmenorrhea in the intervention group compared to the control group. The effect of ice massage at SP6 compared to ice massage at LI4 point on the reduction of pain intensity was greater; however, both methods can be used to reduce pain.

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