



Effects of LI4 Acupressure on Post-cesarean Section Pain

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Abstract

Background: Post-cesarean section analgesia improves functional ability of the mother and her interaction with the infant. Pharmacological methods such as painkillers and narcotics are commonly used to reduce post-cesarean section pain. However, due to the complications of current pharmacological therapies, the use of non-pharmacological methods is currently receiving special attention. The purpose of this study was to evaluate the effects of LI4 acupressure on reducing post-cesarean section pain.

Methods: In this randomized clinical trial, 108 women who were admitted to Fatemiyeh Hospital in Shahroud and had undergone cesarean section were randomly selected and, based on blocks of four, were divided into two groups (acupressure on LI4) and control (touch at the same point). The intervention at LI4 point was made for 20 minutes immediately after full consciousness of the cases and the control group received only touch on this point. Pain intensity in the two groups was measured with a visual analog scale (VAS) before the intervention, immediately after the intervention, 60, and 120 minutes following the intervention. The dose and frequency of narcotics and analgesics taken by the two groups was also measured.

Results: There was no significant difference in pain intensity between the two groups prior to the intervention ($P = 0.87$). Additionally, there were no significant differences between the groups in pain intensity scores immediately, 60, and 120 minutes after intervention ($P > 0.05$).

Conclusions: LI4 acupressure was not effective in reducing post-cesarean section pain.

Keywords: Acupressure, Pain, Cesarean section, LI4 point.

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Introduction

Cesarean section is a major surgery in obstetrics and gynecology, and it is currently among the most common surgical procedures.¹ Thus, the management of post-cesarean section complications is of particular importance.² However, post-cesarean section pain remains a major challenge for health care providers.³ Post-cesarean section pain can lead to the mother's emotional turmoil, disturbs her mental health and conflicts with motherhood duties. Despite the variety of anti-pain options, the quality of post-cesarean section pain control is often inadequate which could possibly be because of the limitations associated with this type of patients. Analgesics used to control post-cesarean section pain should be effective and safe, and should not interfere with the mother's ability to care for the baby, and due to the potential secretion to breast milk, they should also be free of side effects for the baby.⁴ Since current

pharmacological methods of pain relief do not meet the above-mentioned qualifications, the use of alternative complementary therapies such as massage, music, hypnosis, herbal medicine, relaxation, acupuncture, and acupressure have received special attention.⁵

A core tenet of acupuncture and acupressure is that a person's health depends on the balance of energy in the body and the overall energy levels. The hypothesis is that the body's energy flows in channels, called meridians, and these techniques can restore energy balance through the manipulation of these meridians.⁶ One of the important points in the body is LI4 and stimulating this point with pressure or needles can reduce pain. The LI4 point, also called the Hegu point, is the most important acupoint in the body. It is located on the dorsum of the hand, between the first and second metacarpal bones, between the thumb and the index finger.⁷ Acupressure is a variant of acupuncture. In this method, the acupoints are stimulated by continuous, mild pressure with fingertips and thumbs.^{7,8} Instead, of needles, acupressure exerts soft and continuous pressure on acupuncture points. Although, acupressure is an effective way of reducing different types of pain,⁹ its effectiveness in reducing post-cesarean section pain remains uncertain. In a study conducted by Chung and et al., 127 parturient women were assigned to LI4 and BL67 acupressure and control groups. The results of the study showed the effect of LI4 and BL67 acupressure in lessening labor pain.¹⁰ In another study, the effect of acupressure on the SP6 acupoint was effective for decreasing labor pain.¹¹ In an Iranian trial, Hamidzadeh and et al. showed LI4 acupressure was effective at decreasing pain and duration of labor.⁷ In another study by Chen and et al., the effect of acupressure on nausea, vomiting, anxiety, and pain among post-cesarean section women were assessed. In this study, the use of acupressure reduced pain perception of cesarean experiences than the control group.¹² In contrast with effective studies, Heidari et al. found that acupressure on SP6 acupoint did not lessen labor pain.¹³

In light of the above conflicting research, and since acupressure is non-invasive and easily applied, we decided to study the effect of LI4 acupressure on severity of post-cesarean section pain and on post-surgery analgesic consumption.

Materials and Methods

In this double-blind randomized clinical trial, 108 women admitted to the Fatemiyeh Educational and Research Hospital in Shahroud, Iran who had undergone cesarean section, were randomly divided into experimental group (acupressure on LI4)

and control group (touch on the same point). Block randomization with a block size of 4 was used. The effect size was estimated from Chen study¹² for the effect of acupressure on pain among post-cesarean section women (mean difference = 2.0), using a significance level of 0.05, a power of 90%, and an anticipated dropout of rate of 40%, a sample size of per group (total = 54) to determine the intervention effect was calculated. All participants were aware of the study goals, and they signed a written informed consent form prior to the study. The research proposal was approved by the Ethics Committee of Shahrood University of Medical Sciences with the code of R.SHMU.REC.1394.30. Inclusion criteria for the study were 1) full consciousness of the patient after cesarean section; 2) age of 18–45 years; 3) having at least primary education; 4) having no previous experience of using acupressure for any reason; 5) having no scar, bruise, sensitivity, or itching. Patients with pre-eclampsia who took magnesium sulfate in the postoperative period were also excluded from the study.

Data collection tools included demographic and obstetric information forms, which asked about age, education, place of residence, occupation, number of pregnancies and childbirth, anesthesia type, and the amount and type of analgesic drugs taken after cesarean section.

The intervention group received LI4 acupressure immediately after full consciousness. Acupressure on this point was performed by a trained researcher for 10 seconds with 2 seconds of rest during 20 minutes. The accuracy of the point was confirmed when the patient had a feeling of warmth and swelling at that point. The pressure was about 3 to 5 kg and this amount of pressure had already been experienced by the researcher. The control group received touch on the same point without pressure. In both groups, post-cesarean section pain intensity was measured using the visual analog scale (VAS) before the intervention, immediately after the intervention, 60, and 120 minutes after the intervention (pressure and touch). The VAS is a 10-point pain scale, whereby 0 means no pain and 10 means unbearable pain. Patients were blinded to the type of intervention (touch or pressure). Pain intensity was measured by a trained midwife who was not aware of the type of intervention either. To avoid any bias to the extent possible, interventions for all patients were performed by another trained midwife. In order to examine the possible effects of acupressure on physiological parameters of the mother, simultaneous with the intensity of pain, respiratory and heart rates of the mother were also measured and recorded. All patients in both groups received routine care on the ward and at the end, the amount of narcotic drugs or analgesics taken by the two groups were assessed.

An independent t-test was used to compare the mean pain intensity scores in the two groups at different times, and due to repeated measurements of pain intensity as well as pulse rate and respiratory rate during 4 consecutive times, a generalized estimation equation (GEE) was used. The significance level was set at 0.05.

Results

In the present study, the mean (standard deviation (SD)) age of the participants in the intervention and control groups were

28.7 (5.1) and 5.2 (29.2) years, respectively. There was no significant difference in age between the two groups ($P = 0.5$). Other characteristics of the participants in the study in both groups (acupressure) and control (touch) are listed in Table 1. The results in Table 1 showed no significant difference between intervention and control groups in terms of gestational age, parity, occupation, education, place of residence, and type of anesthesia.

Table1: Characteristics of the Acupressure Group and Control (Touch) Group (N= 108)

Variables	Intervention group	Control group	Statistics	P.V
Age	28.7±5.1	29.2±5.2	t= -0.53	0.5
Gestational age	28.3±0.95	38.6±1.05	t= -1.62	0.1
Number of pregnancies	2.2±0.94	2.1±0.94	t= 0.27	0.78
Number of deliveries	0.91±0.7	0.81±0.7	t= 0.7	0.48
Education			$\chi^2=3.3$	0.35
Elementary	8(14.5%)	7(13.2%)		
Junior high school	9(16.4%)	4(7.5%)		
High school	20(36.4%)	27(50.9%)		
College	18(31.7%)	15(28.3%)		
Occupation			$\chi^2=0.25$	0.62
housewife	47(85.5%)	47(88.7%)		
Working	8(14.5%)	6(11.3%)		
Place of residence			$\chi^2=0.49$	0.48
City	36(65.5%)	38(71.7%)		
village	19(34.5%)	15(28.3%)		
Anesthesia type			$\chi^2=3.11$	0.078
General	26(47.3%)	34(64.2%)		
Spinal cord	29(52.7%)	19(35.8%)		

The mean (SD) of pain intensity scores in intervention and control groups before the intervention were 7.50 (2.4) and 7.13 (2.7), respectively, and were not significantly different ($P = 0.45$). The mean (SD) of pain intensity scores of the two groups (acupressure and touch) immediately after the intervention were 5.27 (2.5) and 5.7 (2.6), respectively, which were not significantly different ($P = 0.39$). The mean (SD) of pain intensity scores in both intervention and control groups at 60 minutes after the intervention were 5.27 (2.5) and 5.7 (2.6), respectively, which were similarly not significantly different ($P = 0.79$). Finally, the mean (SD) of pain intensity score at 120 minutes after the intervention in both intervention and control groups, was 4.43 (2.05) and 4.42 (1.9), respectively. There was no significant difference between the two groups at 120 minutes ($P = 0.97$). The mean (SD) dose of analgesics taken by the intervention group was 39.7 (83.44) and for the control group was 44.5 (87.74), which were not significantly different ($P = 0.61$). The mean (SD) number of analgesics consumed in the intervention group was 0.96 (0.42) and in the control group it was 0.96 (0.43). This difference between the two groups was not significant ($P = 0.98$).

The evaluation of pain intensity, pulse rate and respiratory rate, at the four phases of before and after the intervention, and at 60 and 120 minutes after the intervention, was performed through generalized estimation equation (GEE); the results are presented in Table 2. The table shows that the LI4 acupressure, compared to touch on this point, does not have a significant effect on reducing post-cesarean section pain and the average pain score during the two hours after operation decreased

significantly in both groups. As for respiratory and pulse rate, there were no significant differences between the two groups, neither was significant a decrease in respiratory rate and pulse rate within two hours after the cesarean section.

Table 2: Effect of acupressure on pain intensity, pulse rate and respiratory rate of women using a GEE model

Variable	Coefficient	SE	Z	P.V
Pain Intensity				
Group	0.156	0.59	0.26	0.79
Time	-0.82	0.29	-2.84	0.004
Time x Group	-0.037	0.18	-0.21	0.84
Constant	7.64	0.93	8.26	<0.001
Pulse				
Group	1.01	0.81	1.25	0.21
Time	-0.15	0.12	-1.25	0.21
Constant	83.3	1.3	63.7	<0.001
Respiration				
Group	-0.21	0.50	-0.42	0.67
Time	0.074	0.055	1.33	0.18
Constant	19.4	0.80	24.24	<0.001

Discussion

The effect of acupressure on reducing post-cesarean section pain is not clear and because of conflicting reports regarding the effect of acupressure on pain, this study aimed to evaluate the effect of acupressure on post-cesarean section pain. Post-cesarean section pain is somatic and visceral and the maximum pain reported using VAS is 7.¹⁴ Post-surgery pain relief is an important issue, which, if untreated, may bring about complications such as cardiovascular diseases including tachycardia and hypertension, and gastrointestinal disorders including ileus, nausea, and vomiting.¹⁵ Selecting a painkiller after a cesarean section depends on the availability of the drug, executive protocols, individual preferences, resources, and financial considerations.¹⁶ Despite the advancement of knowledge and technology in caring for patients, the common analgesic procedures for post-cesarean section pain relief are not very effective; therefore, complementary interventions and traditional therapies may be helpful. Indeed, extensive studies are needed to evaluate the efficacy of this type of intervention.¹⁷ Acupuncture is often used for pain management and several studies have shown that acupuncture is safer and less costly, compared with routine care.¹⁸ The World Health Organization reports more than a hundred different applications for acupuncture and acupressure. Acupressure is a kind of massage or skin contact which considers all the physical and spiritual aspects of the human body as a monolithic unit.^{19,20} The mechanism of acupressure remains unknown. Peripheral nerve stimulation should be considered as an integral part of the mechanism of acupressure and in case nerve supply is impaired, acupressure will not clinically be effective.²¹ In this study, the effect of acupressure on point LI4 for reducing post-cesarean section pain was investigated. LI4 point is located on the dorsum of the hand, between the 1st and 2nd metacarpal bones between the thumb and index finger.²² This point was chosen because that is where the energy flow is closer to the skin surface and it can be stimulated simply and easily with pressure, needle, or extreme cold.²³

The results of this study showed that the two groups under study were not significantly different in terms of demographic characteristics and pain intensity before the intervention.

Moreover, the results showed no statistically significant difference between the pain intensity felt by the two groups after 20 minutes of acupressure on LI4 immediately and 60 and 120 minutes after the intervention. In line with the results of this study, Hajbagheri and colleagues, who studied the effect of P6 acupressure on pain, nausea, and vomiting after appendectomy, reported no effect of acupressure on reducing pain.²⁴ Yeh and colleagues in their study on the effect of auricular point acupressure (with controlled painkillers) on the pain after lumbar spine surgery showed that ear acupressure had not been effective in reducing pain, which is consistent with the present study.²⁵ Contrary to the results of this study, Wu HC and colleagues conducted a study on effect of acupuncture on post-cesarean section pain and reported that SP6 acupuncture and electro-acupuncture could significantly delay the request for analgesics after cesarean section.²⁶ Chein and colleagues, in a study conducted in 2005 in Taiwan, evaluated the effect of SP6 acupuncture on nausea, vomiting, anxiety, and pain after cesarean section and reported that the intensity of pain and anxiety in the experimental group was significantly lower than the control group.¹² Young-Hun Cho and colleagues in a meta-analysis on the role of acupuncture in reducing pain after back surgery found encouraging but limited evidence to support the effectiveness of acupuncture in reducing postoperative pain after back surgery, and therefore, they suggested that researchers conduct more sound clinical trials.¹⁸

Inconsistencies in the results of these studies can be due to acupuncture or acupressure techniques, such as the use of electro-acupuncture, and also due to the selection of control populations.²⁷ On the other hand, postoperative pain can be influenced by many factors such as age, sex, personality, education, social status, and knowledge of the patient as well as patient's degree of understanding about the surgery, the medical care, time, and physical condition and it is a purely subjective phenomenon.²⁶ Despite the existence of evidence on the effectiveness of acupressure, acupuncture, and ice massage on LI4 in reducing pain,^{7,12} the results of the current study showed no effect of this method on post-cesarean section pain relief. The possible reason for this lack of impact may be the nature of the pain, the location of surgery, the surgery duration, and the length of acupressure performance as well as the small sample size of the study. According to this research, acupressure had no effect on physiological parameters of pulse and respiration of the mother. Lee and colleagues studied the effect of SP6 acupressure on anxiety, heart rate and position of the baby during labor. The results of Lee's study showed that although the number of heart rate immediately and at 30 and 60 minutes after the intervention had no significant difference in the two groups, the pulse rate was more balanced in the acupressure group and it increased in the touch group.¹¹ Our results are consistent with the results of these researchers.

In this study, after randomization, the main predictors of outcome were comparable between two groups. Several factors such as individual differences in pain limits and cultural, social, psychological, and mental elements could affect pain measurement. Another limitation was that this method was new, and the participants' unfamiliarity with this manner of pain lessening could have influenced the results. With regard to

effect size of intervention on pain intensity of post-caesarian section, we suggested further studies.

As the results of this study indicate, LI4 acupressure was not effective in reducing post-caesarian section pain compared to touching the LI4 point. There were not significant differences between the groups in pain intensity scores, respiratory rate, and pulse rate immediately and 60 and 120 minutes after intervention. In the end, the researchers recommend further studies to evaluate the effect of acupressure on reducing post-caesarian section pain.

Conflict of Interest

The authors declare that they have no conflict of interests.

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