



## THE EFFECTS EFFECTS OF SP6 AND LI4 ACUPRESSURE POINTS ON PAIN AND DURATION REDUCTION DURING THE FIRST STAGE OF LABOR: AN EVIDENCE-BASED CASE REPORT

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**Abstract, Background:** Painless delivery and effective labor pain management are among the strategies to encourage vaginal delivery and reduce the rate of cesarean section. Several non-pharmacological methods, such as acupressure, can be performed to reduce labor pain and shorten the duration of delivery.

**Method:** Advanced search for literatures in ProQuest, Willey, and Scopus was conducted in April, 2022.

**Objectives:** To observe the effect of acupressure on relieving pain and reducing time during the first stage of labor.

**Result:** There were three articles relevant with the eligibility criteria. Three studies of randomized controlled trials showed that acupressure on SP6 point could relieve pain and acupressure on LI4 point could reduce time during the first stage of labor. A systematic review and meta-analysis found that acupressure on SP6 and LI4 points could manage length and pain severity of labor.

**Conclusion:** Application of combining acupressure on SP6 and LI4 was found to have an effect on relieving labor pain and reducing labor time during the first stage.

**Keywords:** Acupressure; labor pain; duration; SP6; LI4

### Background

The process of childbirth is described as the most severe pain during a woman's lifetime. The inability to control labor pain intensity can cause stress, fear and anxiety in women. It may negatively affect the health of the mother and baby such as fetal distress, reduce neonatal Apgar score, and increase midwifery interventions associated with obstetrics complications. The severity of labor pain sometimes causes intense fear over women's childbirth, reduces their perceived ability to have a vaginal delivery, and eventually makes them prefer a cesarean section delivery to avoid labor pain. According to the World Health Organization, the ideal cesarean rate is accepted as 10% to 15%, but 17,7% of the babies in Indonesia were born

through cesarean delivery, according to a nationwide study. Therefore, women in Indonesia need appropriate education in order to select vaginal birth as the main choice of giving birth<sup>(1)</sup>

Labor pain management is important in reducing the rate of the elective cesarean section number. Cervical dilatation, uterine contractions, vaginal and pelvic floor tension are the leading causes of this pain with gradually increasing severity. The labor pain in the first stage is visceral and cannot be localized well. Several non-pharmacological methods can be performed to reduce pain in the first stage of labor. The methods of labor pain management should be simple, reliable, and maintain fetal hemostasis. Studies have

shown acupressure to be beneficial for the management of pain during labor. Acupressure is one of the non-pharmacological methods which is non-invasive, safe for both the mother and infant, and supported by scientific evidence.<sup>(2)</sup>

In this method, pressure is applied using fingers, palms, elbows or knees to acupuncture points on the skin, which are located on 12 main energy pathways called meridians. Acupressure builds balance by helping regulate blood circulation and providing the necessary energy to the body. For example, ensuring the upregulation of macrophages M2, which have an anti-inflammatory function during childbirth. It also helps to eliminate lactic acid accumulated in the body during muscle contractions so that it can reduce pain. Several acupuncture points including GB21, LI4, SP6, ST36, BL32 are used to reduce the intensity of labor pain specifically. Previous studies have proven that stimuli at these acupressure points are able to stimulate uterine contractions and reduce labor pain.<sup>(3)</sup>

There have been several studies describing the effect of acupressure on SP6 and LI4 points. However, there are limited numbers of studies investigating the effects of these combined methods. The present study aimed to assess the effect of combining acupressure on SP6 and LI4 points during the first stage of labor.

### Case Illustration

A 20-year-old woman G1P0A0 with a gestational age of 38-39 weeks came with quite intense contraction and bloody show since seven hours ago without any fluid from vagina, and fetal movements still felt by the patient. During examination at 07.30 WIB, she was mentally alert, vital signs within normal limits, TD: 130/80 mmHg, N: 84x/min, R: 20x/min, S: 36.4°C. On physical examination (abdomen), symphysis-fundal height: 31 cm, Leopold I: buttocks, Leopold II: back (right), Leopold III: head has entered pelvic inlet, Leopold IV: divergent ( $\frac{2}{5}$ ), hicks: 4x10'35", fetal pulse: 132x/min, regular. Within genitalia inspection, there was an ejection of mucus mixed with blood, and there were no signs of infection. The results of the examination in no abnormalities in the vulva and vagina, stiff

perineum, soft thin portion, the cervical opening of 4 cm, intact amniotic, presentation of the head, front right fontanelle position, molasses 0, a decrease of the lowest part in station -2, no leading small part. A pain scale of 8 (severe pain) was measured using the NRS (Numeric Rating scale). The patient whimpered in pain, saying he couldn't do anything and couldn't bear the pain. Interventions through acupressure at the SP6 and LI4 points are given for 3 minutes and repeated whenever there is a contraction. After 30 minutes of acupressure, the patient said the pain felt reduced. The patient's pain level was assessed and obtained a scale of 6 (moderate pain). It means that there is a decrease in the pain scale from the category of severe pain to moderate pain. In the next cervical dilatation examination at 11.30 WIB, a 10 cm (complete) cervical dilatation was obtained.

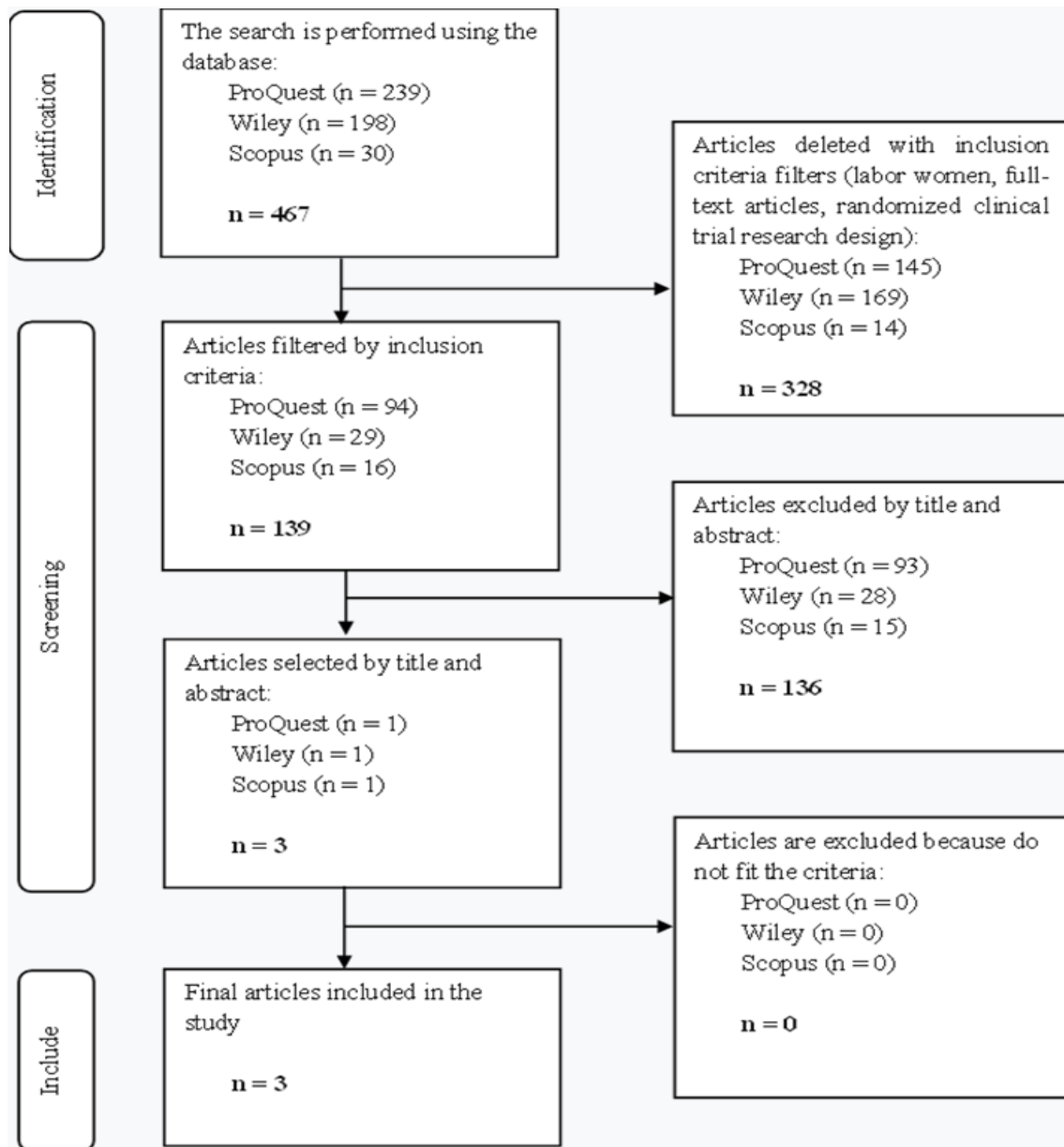
### Methods

Can acupressure on SP6 and LI4 point during the first stage of labor reduce labor pain and shorten the duration of delivery?

P : Labor woman  
I : Acupressure on SP6 and LI4 point  
C : No comparison  
O : Labor pain and duration

Advance searching was conducted via usage of programmed Boolean operators. Three out of 467 studies were systematically selected from three main databases such as ProQuest, Wiley, and Scopus. Literature searching was done with the following keywords: "labor" AND "acupressure" AND ("pain" OR "duration"). This article was selected based on the inclusion and exclusion criteria. Inclusion criteria were as follows: (i) clinical trial study, (ii) acupressure on SP6 or LI4 point, (iii) publication within the last 5 years. Exclusion criteria encompassed: (i) meta-analyses, review, case report, editorials or perspectives study, (ii) irrelevant articles, (iii) not published in English or Bahasa Indonesia, and (iv) not accessible. Final articles were then appraised for the objective assessment using the Critical Appraisal Skills Programme (CASP) appraisal tools before analyses of results.

Figure 1. PRISMA flow chart



**Table 2.** Characteristics of study

Article by	Study Design	Level of Evidence	Characteristic of population	Number of Subjects	Therapy	Outcome
Najafi, Fatemeh, et al. (2018)	Systematic Review and Meta-Analysis	Ia	Active phase of labor and of the first and second stages of labor in women with one or more children.	16 meta-analysis articles (SP6 examined 1,100 subjects and the studies on LI4 looked at 552 subjects)	Acupressure on the: - P6 point - LI4 point	Labor woman experienced less pain immediately after received SP6 acupressure (-0.56, 95%, CI: -0.77, -0.36) and LI4 acupressure (-0.94, 95%, CI: -1.36, -0.53). The length of labor was decreased after received acupressure on SP6 point (-0.99, 95% CI: -1.39, -0.39) and LI4 point (-0.55, 95%, CI: -0.95, -0.15)
Turkmen, H., & Ceber Turfan, E. (2020)	Randomized Controlled Trial	Ib	Primiparous women at-term (greater than or equal to 37 weeks gestation), single healthy fetus, at 4 cm cervical dilatation, regular contractions, not receiving analgesia or anesthesia, without any risk.	60 labor women: experiment group (n=30), control group (n=30)	Acupressure was applied on the SP6 point in one group (experimental group), and the SP6 point was only touched slightly without applying pressure in control group.	Application of acupressure on SP6 was found to have a positive effect on pregnant women's labor experience and reducing the labor pain and shortening the duration of first stage of labor compared to touch on SP6 (Chi-square = 5.711, p = 0.017).
Hamlaci, Y., & Yazici, S. (2017)	Randomized Controlled Trial	Ib	Participants had to be 37 to 40 weeks' pregnant by USG, have only 1 fetus with a fetal weight of 2500 to 4000 g, no complications, no systemic diseases, had the labor process spontaneously, had a cervical dilation less than 5 cm.	88 labor women: experiment group (n=44), control group (n=44)	Acupressure was applied to Point LI4 on both the hands at the same time from the beginning to the end of the contraction (16 times). Evaluation with the visual analog scale was made 6 times. The control group received routine care.	Applying acupressure to Point LI4 was found to be effective in decreasing the perception of labor pains and shortening the labor (p < .05)

## Results and Discussion

Following the search strategy, three original articles qualify for this evidence-based case report (Figure 1). The first study is a Systematic Review and Meta-Analysis with a level of evidence Ia. The second and the third studies are RCTs with a level of evidence Ib. The characteristics of the study are shown in Table 2. Based on the assessment using the Critical Appraisal Skills Programme (CASP) assessment tool, the final articles meet the aspects assessed. The studies were valid for randomized controlled trials and systematic review and meta-analysis study, methodologically sound and can help locally.

The application of the Evidence-Based Case Report for the intensity of labor pain refers to a study conducted by Hamlaci et al (2017) in which acupressure or pressure rotates clockwise using the thumb given at the LI4 point located between the first and second carpal bones which are carried out from beginning to end in the presence of any contractions. The study sample consists of 88 pregnant women (44 acupressure group and 44 control group). Acupressure was applied to the study group when cervical dilatation reached 4 to 5 cm and 7 to 8 cm. Acupressure was applied to point LI4 on both the hands at the same time from the beginning until the end of the contraction (16 times). The control group received routine care. There was a significant difference between the groups in terms of total duration of labor. As shown from this study, applying acupressure to point LI4 was found to be effective in decreasing the perception of shortening the labor ( $p < 0.05$ ).<sup>(4)</sup>

Meanwhile, the decrease in the acceleration of the duration of delivery between labor women during the active phase I refers to research conducted by Turkmen and Ceber (2020) where acupressure is a treatment to give pressure rotates clockwise using the thumb given at the SP6 point, which is 3-4 fingers above the medial malleolus bone or on the inner ankle in the soft tissue of the back of the bone which is carried out from beginning to end of every contraction. As the primary outcome, labor pain was less and duration of labor was shorter for the experimental group. As the secondary outcome, satisfaction was increased that could be as a result of reduced pain in labor and/or shorter duration of labor. The perceived pain level in the active stage in the experimental group ( $n = 30$ ) was less than the control group ( $n = 30$ ) (labor pain:  $7.17 \pm 0.89$  vs.  $7.66 \pm 0.71$ ,  $p = 0.002$ ). In the experimental group, the mean duration of the first stage of labor was

shorter than the control group ( $4.88 \pm 0.85$  hour vs.  $5.56 \pm 0.66$ ,  $p = 0.001$ ). In addition, pregnant women in the experimental group would recommend this method to other pregnant women (Chi-square = 5.711,  $p = 0.017$ ).<sup>(5)</sup>

Najafi, Fatemeh, et al (2018) in a systematic review and meta-analysis study concluded that the application of acupressure at the SP6 and LI4 points is an effective method in reducing the intensity of pain and shortening the duration of delivery in maternity mothers during the active phase I. After the intervention, labor woman experienced less pain immediately after received SP6 acupressure ( $-0.56$ , 95%, CI:  $-0.77$ ,  $-0.36$ ) and LI4 acupressure ( $-0.94$ , 95%, CI:  $-1.36$ ,  $-0.53$ ). The length of labor was decreased after received acupressure on SP6 point ( $-0.99$ , 95% CI:  $-1.39$ ,  $-0.39$ ) and LI4 point ( $-0.55$ , 95%, CI:  $-0.95$ ,  $-0.15$ ).<sup>(6)</sup>

Several recent studies have focused on the use of complementary therapies and alternative drugs as a method of reducing pain intensity and duration of labor, including acupressure. Acupressure is a non-pharmacological method derived from acupuncture and has been used worldwide since a long time ago. Acupressure is the application of pressure to certain points of the body to relieve muscle tension, improve blood circulation, and restore the body's vital energy. Acupressure aims to ensure a smooth flow of the body's Qi energy to promote beneficial healing responses. Qi is the crucial energy found everywhere in the universe and all people are born with qi. If qi is disrupted, the body will fail to maintain balance then diseases may occur. Acupressure helps to establish balance by helping the regulation of blood circulation and providing the necessary qi energy for the body. This supports the secretion of neurotransmitters, which decrease pain by increasing the amount of adrenocorticotrophic hormone released from the anterior pituitary. Acupressure also activates the secretion of chemicals, such as beta-endorphin, serotonin, dopamine, and noradrenaline, into the blood flow. Therefore, acupressure serves many functions throughout the body. For instance, it ensures the upregulation of M2 macrophages, which have anti-inflammatory functions during labor. It also aids in the removal of lactic acid accumulated in the body during muscle contractions, which reduces pain. Acupressure can positively affect labor women's comfort.<sup>(3)</sup> Various points used in acupressure related to the delivery process include SP6 and LI4 points.<sup>(6)</sup> The SP6 point is located on 3-4

fingers above the medial malleolus bone or on the inner ankle in the soft tissue behind the bone. Acupressure given at the SP6 point will stimulate the release of oxytocin from the pituitary gland which then regulates uterine contractions thus shortening the duration of labor.<sup>(5)</sup> The LI4 point is located between the first and second carpal bones where the flow of energy is closer to the surface skin. Acupressure performed at the LI4 point can reduce the intensity of labor pain.<sup>(4)</sup>

To carry out this intervention, the investigator has attended finger puncture, acupressure, and hypnosis training in pregnant, maternity, and puerperal women in 2021. In this case study, the maternity mother was given acupressure at the SP6 and LI4 points whenever the mother felt a contraction. After 30 minutes, the maternal maternity pain scale measured using the Numeric Rating Scale (NRS) showed a decrease, from severe to moderate pain. Meanwhile, the progress of labor observed on the partograph was 4 cm of cervical dilatation before being given acupressure. Then, the next four hours after the intervention, it obtained a 10 cm cervical dilatation (complete dilatation) was followed by signs of symptoms during II labor.

This is in agreement with other reviews that acupressure on SP6 and LI4 were the most commonly used acupoints because of their specific effect of increasing uterine contractions, shortening length of labor and reducing labor pain. The secondary outcomes of this review suggest a shorter duration of labor (first stage and total duration of labor) and a higher level of women's satisfaction with pain relief in acupressure groups. On this manner, it also concluded that acupressure may have a role in increasing satisfaction in pain management during labor.<sup>(7)</sup>

## Conclusion

All three studies consisting of RCTs and Systematic Review and Meta-Analysis studies found that acupressure at SP6 and LI4 points showed promise as a method for managing the length and severity of labor pain. Acupressure is one of the non-pharmacological methods that can be applied in childbirth obstetric care because it is easy to do, self-controlled, non-invasive, and cost-effective. However, further study is required to establish its effectiveness along with other pharmacological and nonpharmacological methods.

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