

The Effect of Acupressure on Sanyinjiao and Hugo Points on Labor Pain in Nulliparous Women: A Randomized Clinical Trial

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ABSTRACT

Introduction: Most women have experienced child birth and its pain, which is inevitable. If this pain is not controlled it leads to prolonged labor and injury to the mother and fetus. This study was conducted to identify the effect of acupressure on sanyinjiao and hugo points on delivery pain in nulliparous women. **Methods:** This was a randomized controlled clinical trial on 84 nulliparous women in hospitals of Ardebil, Iran. The participants were divided by randomized blocks of 4 and 6 into two groups. The intervention was in the form of applying pressure at sanyinjiao and hugo points based on different dilatations. The intensity of the pain before and after the intervention was recorded by visual scale of pain assessment. To determine the effect of pressure on the intensity of labor pain, analytical descriptive test was conducted in SPSS (version 13). **Results:** There was a significant decrease in mean intensity of pain after each intervention in the experimental group with different dilatations (4, 6, 8, and 10 cm). Moreover, the Student's independent t-test results indicated that the mean intensity of pain in the experimental group after the intervention in all four dilatations was significantly lower than the control group. Repeated measures ANOVA test indicated that in both experimental and control groups in four time periods, there was a statistically significant difference. **Conclusion:** Acupressure on sanyinjiao and hugo points decreases the labor pain. Therefore, this method can be used effectively in the labor process.

Introduction

Child birth is an important phenomena and perhaps one of the most painful experiences that mothers have in their life.^{1,2} Pain is a common and indispensable component of the delivery. Delivery pain occurs by the stimulation of the nerve receptors followed by uterine muscle contractions and is felt in the lumbosacral, hip, and gut areas.³ The pain is more severe and prolonged in nulliparous women and it might lead to confusion and, loss of confidence for them.⁴

Every year thousands of planned and elective cesarean sections are performed due to the fear of pain, especially in nulliparous women.⁵ Labor pain causes an increase in epinephrine and norepinephrine, blood pressure and heart rate, oxygen consumption for the mother, and beta-endorphins. Vasoconstriction induced by catecholamine causes a decrease in uterine blood flow, and this matter can lead to increase in dystocia and decrease in neonatal Apgar.^{6,7} Therefore, the aim of all the delivery care units is to decrease the pain, and transform it into a

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pleasant experience.⁸ The use of non-pharmacological methods for reducing labor pain are superior to pharmacological methods due to ease of implementation, noninvasiveness, building confidence and participation of the patients, lack of effectiveness on the delivery process, and lack of side effects for the mother and fetus. Massage, exercise, aromatherapy, and acupressure are examples of non-pharmacological methods.⁹

Acupressure is one of the branches of acupuncture in which the pressure of the thumbs on specific points is used to balance the flow of the body's energy.¹⁰ There are multiple pressure points in the body the use of which can improve delivery and reduce its pain. It is believed that stimulating these points stimulates uterine contractions resulting in labor progress, and balances the energy and reduces the pain.¹¹ One of these points is sanyinjiao (SP6) or the junction of three channels of spleen, liver, and kidney; four fingers (3 CUN) are placed above the inner ankle of the feet behind the posterior edge of the tibia (Figure 1).¹² The other point is hugo (LI4), which is the important part of the large intestine meridian. This point is placed at the back of the hand, between the first and second metacarpal bone, beside the base of the second metacarpal (Figure 2).¹³

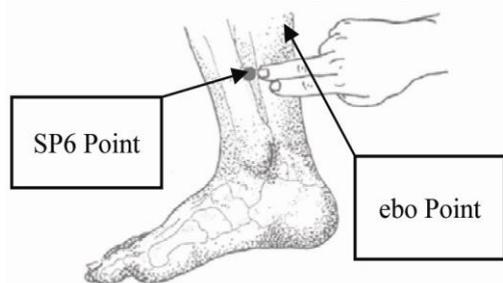


Figure 1. SP6 point and placebo point

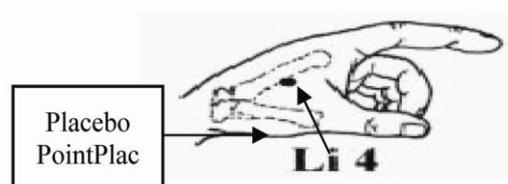


Figure 2. Hugo point (LI4) and placebo

Using pressure on these points (SP6 and LI4) leads to simultaneous release of lower and upper limb energy and results in the alleviation of pain.¹⁴ No research has been found to study the effect of both points, but there are studies regarding acupressure on SP6 and LI4 separately. The results of these studies show that acupressure reduces labor pain.¹⁵⁻¹⁸ The results of the study by Heydari et al. indicated that acupressure on sanyinjiao point had no effect on labor pain.¹⁹ Moreover, another study conducted by Hjelmstedt et al. revealed that sanyinjiao point stimulation had short term effect on reducing labor pain and suggested that acupressure can be used during the active phase of labor.²⁰

Delivery pain relief is the key role of the midwife and the midwife accompanies the mother during labor. Furthermore, no studies have been found on the effects of acupressure on SP6 and LI4 simultaneously. Due to the above reasons and the intensity of labor, especially in nulliparous women, this study aimed to investigate the effect of acupressure on sanyinjiao and hugo points on labor pain of pregnant women, who referred to the public hospital of Ardebil, Iran. With the application of the results from this study we plan to reduce the suffering and pain of mothers and protect their health.

Materials and methods

The present study was a randomized controlled clinical trial. The nulliparous women chosen for the study had the following specifications: 18 to 35 years old, gestational age of 37 to 42 weeks (according to LMP or ultrasound in less than 12 weeks), singleton pregnancy, at least 4 cm dilation (entering the active phase of labor), viewing the head, intact amniotic sac at examination, or elapse of 6 hours after the rupture of the amniotic sac, spontaneous onset of uterine contraction, have low risk pregnancy (such as the absence of chronic disease like heart disease, hypertension, lung disease, diabetes, anemia, urinary tract infection, thyroid disease, and epilepsy, did not have abortion,

dead fetus, bleeding or any abnormality when referring to the hospital), fetal weight of less than 4000 g (based on Johnson formula), absence of cephalopelvic disproportion (CPD) during vaginal examination, height of more than 145 cm, no lesions in sanyinjiao and hugo points, no disabilities that lead to communication problems for the mother (deafness, blindness, etc.).

The data gathering tools consisted of a demographical questionnaire and standard visual pain scale assessment, which evaluated pain in the scale of 0 to 10 (0 indicating no pain, and 10, intense pain). The sample size was based on a similar local study and was calculated according to mean comparison formula.²¹ The sample size was determined as 38 patients in each group, and considering 10% drop of samples, 42 patients in each group were selected ($\mu_1 = 3.5, \mu_2 = 4.4, \alpha = 0.05, \text{Power} = 0.80, \text{sd}_1 = 0.9, \text{sd}_2 = 0.8, n = 42$).

This study has been confirmed by the Research Council of the School of Nursing and Midwifery, and the Research and Ethics Committee of Tabriz University of Medical Sciences (ethic code: 9076). The CONSORT principles have been followed in this study.

The aim of the study was explained to all the eligible women who were taken to the delivery room of Alavi and Sabalan Hospitals for vaginal delivery (from February 2012 to May 2012). If they were willing to participate in the study, an informed consent was written and the demographic questionnaire was completed by them. Then they were randomly assigned to experimental and control groups by randomized blocking. In order to hide the full allocation, the block sizes were not the same and blocks of 4 and 6 were used. Allocation sequence was determined after listing all the block possibilities, assigning a number to each of them (using Rand list software), and randomly assigning the blocks so that the total number of subjects would be 84. The intervention was performed by the researcher's assistant, who had previously had acupressure training. The researcher

recorded the intensity of the pain before and after the intervention. The participants, and people who gathered data and analyzed the information were not aware of the individuals' group placement.

For all the subjects, actions in labor such as vaginal exam and fetal heart monitoring were performed by the researcher. No interventions such as sedative injection, syntocinon-injection, and amniotic sac rupturing were performed for the study participants. The subjects were positioned in their comfortable position (prone, sitting, or standing). To perform the intervention, in 4 cm dilation, with the start of the contraction in the experimental group (group with pressure on SP6 and LI4), the research assistant applied vertical pressure with her thumb on the sanyinjiao points of both feet of the patient. With the start of the first contraction, pressure was applied gradually for 30 seconds on the above mentioned points. Then this pressure was slowly intensified to the extent that the patient felt tingling, numbness, heaviness, and strain in the surrounding area. The amount of applied pressure was identified by the research assistant's thumb nail color. When the thumb nail turned white the most pressure was applied. At this point the pressure was held for 1 minute and then it was gradually decreased. The points were free of pressure for 30 seconds. Then for 5 minutes the hugo points on both hands were pressed during the contractions followed by the pressure on the sanyinjiao points on the foot for 5 minutes. This process continued for 20 minutes only during the uterine contractions (the number of contractions varied based on each patient). Finally, the pain intensity was recorded in the standard visual pain scale assessment by the researcher before and after the end of the 20 minutes. The pressure was not applied until reaching 6 cm dilation and during 6, 8, and 10 cm dilations the above mentioned process was again performed.

In the control group for blinding of the participants, pressure was applied on

ineffective areas of the legs and hands (Figure 1 and 2) with the same timing and condition as the above and by the research assistant's thumb. The pressure in the control group was to the extent that the participants felt the first pain. In the end, mean intensity of the pain were recorded and compared two by two in 4, 6, 8, and 10 dilations before and after the intervention in both groups. To compare the demographical information of the groups, chi-squared test was conducted. Paired t-test was performed to compare the mean intensity of the pain in each group before and after the intervention. In order to compare the mean intensity of labor pain in both control and experiment groups, independent sample t-test and Mann-Whitney test were performed. Moreover, to avoid alpha error of multiplicity, repeated measurement analysis was used in SPSS for Windows (version 13; SPSS Inc., Chicago, IL., USA). P values < 0.05 were considered significant.

Results

The two groups were similar in terms of demographic characteristics. Mean age of participants in the experimental group was 22.23 ± 4.11 years and in the control group was 21.50 ± 3.83 years. 62 of the subjects

(74%) were 18 to 23 years old. Minimum age was 18 and maximum was 35 years. All the subjects were house wives (Table 1). The results from Student's independent t-test showed that there was no significant difference between the two groups before the intervention regarding the intensity of pain ($p = 0.816$, $t = 0.23$, $df = 8$). In the experimental group results of the paired t-test indicated that the mean (SD) intensity of pain in 4 cm dilation before and after the intervention were 5.88 (1.72) and 4.04 (1.51), respectively. In the control group the mean (SD) intensity of pain in 4 cm dilation before and after the intervention were 5.78 (1.99) and 6.38 (1.92), respectively. In the experimental group the mean intensity of pain after the intervention had significantly decreased and in the control group it increased significantly. The comparison of the overall results from the intensity of pain in both groups in different dilations has been shown in table 2.

Student's t-test in 4, 6, 8, and 10 cm dilations after the intervention among both groups showed a significant difference. The intensity of pain in the intervention group had decreased. Furthermore, ANOVA with repeated measures using Wilks' Lambda

Table 1. Demographic characteristics of the participants in both experiment and control groups

Demographic characteristics	Experimental group (n = 42)	Control group (n = 42)	Statistical indicators
Age (year)			
18–23	28 (66.7)	34 (81)	$p = 0.21$
24–35	14 (33.4)	8 (19.1)	$df = 82$
Mean (SD)	22.23 (4.11)	21.50 (3.83)	$t = 0.84$
Education			
Elementary	16 (38.1)	19 (45.3)	$p = 0.77$
High school	10 (23.8)	8 (19)	$df = 2$
Diploma and higher	16 (38.1)	15 (35.7)	$X^2 = 0.51$
Spouse occupation			
Employed	32 (76.1)	33 (78.5)	$p = 1$
Unemployed	10 (23.8)	9 (21.4)	$df = 1$
			$X^2 = 0.06$
Income			
Earn more than spend	9 (21.4)	7 (16.7)	$p = 0.51$
Earn equal to spend	27 (64.3)	25 (59.5)	$df = 2$
Earn less than spend	6 (14.3)	10 (23.8)	$X^2 = 1.32$

*Data are presented as number (%), unless other title is provided

Table 2. Comparison of the mean intensity of pain before and after the intervention in different dilatations in both control and experiment groups

Pain intensity	n = 42	Before intervention Mean (SD)*	After intervention Mean (SD)	Mean difference (CI 95%)	Statistical indicators [†]
4 cm dilation	Experiment	5.88 (1.72)	4.04 (1.51)	1.83 (1.53, 2.13)	p < 0.001
	Control	5.78 (1.99)	6.38 (1.92)	-0.59 (-0.90, -0.28)	t = -6.17 df = 82
6 cm dilation	Experiment	7.26 (1.34)	4.52 (1.32)	2.73 (2.38, 3.09)	p < 0.001
	Control	7.61 (1.86)	8.11 (1.61)	-0.50 (-0.74, -0.25)	t = -11.15 df = 82
8 cm dilation	Experiment	7.78 (1.22)	4.66 (1.35)	3.11 (2.72, 3.51)	p < 0.001
	Control	8.78 (1.35)	9.21 (1.15)	-0.42 (-0.75, -0.10)	t = -16.52 df = 82
10 cm dilation	Experiment	8.42 (1.01)	5.59 (1.69)	2.83 (2.41, 3.25)	p < 0.001
	Control	9.66 (0.84)	9.83 (0.48)	-0.16 (-0.33, 0.00)	t = -15.54 df = 82
Repeated measurement test result	Experiment		F = 82.88	df = 3	P < 0.001
	Control	-	F = 48.62	df = 3	P < 0.001

*Standard deviation[†]Independent t-test after intervention

index showed a significant difference in control and experimental groups in four time intervals (4, 6, 8, and 10 cm dilatations). Mann-Whitney test also indicated that there was a statistically significant difference between groups (Table 2).

Discussion

Results of the present study indicated that acupressure on sanyinjiao and Hugo points reduces labor pain considerably. An experimental study by Kaviani et al. studied the effects of acupressure and ice massage on LI4 for 30 minutes on labor pain intensity and patient's anxiety.²² Their results showed that the intensity of pain had a significant decrease immediately after the intervention in the experimental group compared to the control group ($p \leq 0.001$), which is similar to the results of the present study. A clinical trial by Lee et al. aimed to determine the effect of SP6 pressure on labor pain in two groups.¹⁷ The results indicated that SP6 stimulation caused a significant decrease of pain throughout the labor intensity measurement in the experimental group compared to the control group. This result is also similar to the present study. Kim et al. found

that pressure on sanyinjiao and hugo points reduced the intensity of labor pain in two groups receiving pressure on LI4 and SP6 in contrast to the control group.¹⁵ However, these groups were not significantly different regarding pain relief in labor. Park et al. also studied the effect of 30 minutes pressure on SP6 point on labor pain, and frequency and intensity of uterine contractions during labor.¹⁶ They stated that pressure on SP6 in the active phase of labor reduced labor pain; this is consistent with the results of the current study. Salehian et al. determined, in their study entitled "The effect of pressure at hugo point on labor pain in nulliparous women", that applying pre-ssure on hugo point relieves labor pain.¹⁸ In another study, entitled "The effect of pressure at sanyinjiao point on labor pain in nulliparous women", Salehian discovered that the intensity of pain in the experimental group after the intervention was less than the control group, which was similar to the present study. However, in 10 cm dilation there was no significant difference between the two groups (control and intervention) after the intervention, which is inconsistent with the present study. It seems that the use of two

points in this case was effective, since in the present study the pressure was applied on two points of LI4 and SP6, but in Salehian's study the pressure was applied only on SP6.²³

Expressing the intensity of pain by the participants was a self-report, and it might vary based on different people and this report was out of the researcher's responsibility. People have different pain thresholds. We were able to control these restrictions by randomly selecting the subjects.

Conclusion

Applying pressure on sanyinjiao and hugo points in different dilations reduces labor pain. Therefore, the findings of the present study with regard to ease of implementation, being safe, and being acceptable for patients can be used in clinical practices.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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References

1. Simkin PP, O'hara M. Nonpharmacologic relief of pain during labor: systematic reviews of five methods. *Am J Obstet Gynecol* 2002; 186(5 Suppl Nature):S131-S159.
2. Safdari Dehcheshmaei F, Salehiyan T, Kazemeyan A, Frouzandeh N, Safarzadeh A, Hassanpour A. The effect of music on labor pain in the active phase of the first stage of labor in primiparous women. *Journal of Shahrekord University of Medical Sciences* 2009; 10(4):65-71. (Persian)
3. Waters BL, Raisler J. Ice massage for the reduction of labor pain. *J Midwifery Womens Health* 2003;48(5):317-21.
4. Rezaeipour A, Idenloo F, Khakbazan Z, Kazemnejad A. The effects of Entonox on implication of painless labor and delivery satisfaction rate among pregnant women. *Hayat* 2007; 13(4):45-58. (Persian)
5. Seyed Nori T. Study of reasons in choosing Cesarean section by pregnant mothers refers to a health care center of Rasht [Master thesis]. Tehran, Iran: School of Nursing and Midwifery, Tehran University of Medical Sciences; 2005. p. 121. (Persian)
6. Esfandiari M, Nankaley A, Sanjari N, Almasi A, Karimi S. Effectiveness of entonox on severity of labor pain in women referred to maternity ward of Imam Reza hospital, Kermanshah, 2007. *Journal of Ilam University of Medical Sciences* 2009; 17(1):25-30. (Persian)
7. Motaghi Z, Jafar Nejad F, Salari P, Esmaeeli H. Comparison the effects of socio economical characteristics of mothers with elective cesarean section and vaginal delivery. *Journal of Nursing and Midwifery, Mashhad* 2000; 2(4):49-56. (Persian)
8. Abushaikha L, Oweis A. Labour pain experience and intensity: a Jordanian perspective. *Int J Nurs Pract* 2005; 11(1):33-8.
9. Field T. Pregnancy and labor alternative therapy research. *Altern Ther Health Med* 2008;14(5):28-34.
10. Tournaire M, Theau-Yonneau A. Complementary and alternative approaches to pain relief during labor. *Evid Based Complement Alternat Med* 2007; 4(4):409-17.
11. Cook A, Wilcox G. Pressuring pain. *Alternative therapies for labor pain management. AWHONN Lifelines* 1997; 1(2):36-41.
12. Beal MW. Acupuncture and acupressure. Applications to women's reproductive health care. *J Nurse Midwifery* 1999; 44(3):217-30.
13. Jingsheng Z. Life Cultivation and Rehabilitation of Traditional Chinese Medicine A Newly Compiled Practical English-Chinese Library of Traditional Chinese Medicine. Shanghai: Shanghai University of Traditional Chinese Medicine; 2007. p. 125.
14. Xing Nong C. Chinese Acupuncture and Moxibustion. 3rd ed. Beijing, China: Foreign Language Press; 2010.
15. Kim YR, Chang SB, Lee MK, Maeng WJ. Effects on Labor Pain and Length of Delivery Time for Primipara Women treated by San-Yin-Jian(SP-6) Acupressure and Hob-Gog(LI-4) Acupressure. *Korean J Women Health Nurs* 2002; 8(2):244-56.
16. Park Y, Cho J, Kwon J, Ahn E, Lim J, Chang S. The effect of san-yin-Jiao (SP6) acupressure on

- labor progression. *Am J Obstet Gynecol* 2003; 189(6 Suppl):209.
17. Lee MK, Chang SB, Kang DH. Effects of SP6 acupressure on labor pain and length of delivery time in women during labor. *J Altern Complement Med* 2004; 10(6):959-65.
 18. Salehian T, Safdari F, Pirak A, Kazemian A, Atarodi Z, Navabi-Righi SH. Effects of acupressure at the hugo point(LI4) on labor pain and duration of delivery in nulliparous women. *Journal of Ilam University of Medical Sciences* 2011; 18(4):12-9. (Persian)
 19. Heydari P, Mojdeh F, Mazloun SR, Tanbakuei K, Judaki K. The effect of SP6 acupressure on length of labor. *The Iranian Journal of Obstetrics, Gynecology and Infertility* 2008; 11(2):15-22. (Persian)
 20. Hjelmstedt A, Shenoy ST, Stener-Victorin E, Lekander M, Bhat M, Balakumaran L, et al. Acupressure to reduce labor pain: a randomized controlled trial. *Acta Obstet Gynecol Scand* 2010;89(11):1453-9
 21. Samadi P, Lamiyan MN, Heshmat R, Faghihzadeh S. Effect of Acupressure at Sp6 Point on Labor Pain Intensity. *Hormozgan Medical Journal* 2010; 14(1):55-64. (Persian)
 22. Kaviani M, Ashoori M, Azima S, Rajaei Fard AR, Hadian Fard MJ. Comparing the effect of two methods of acupressure and ice massage on the pain, anxiety levels and labor length in the point LI-4. *Journal of Shahid Sadoughi University of Medical Sciences* 2012; 20(2):220-8. (Persian)
 23. Salehian T, Safdari Dahchehmeh F, Alavi A, Rahimi Madideh M. Effects of acupressure at the sanyinjiao point (SP6) on labor pain and duration of delivery in nulliparous women. *Journal of Shahrekord University of Medical Sciences* 2010; 12(4):8-14. (Persian)