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Research Article

The Effect of Acupressure at the Sanyinjiao Point (Sp-6) On Labor Duration: A Single-Blind Clinical Trial

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Received: December 16, 2021; **Published:** February 25, 2022

Abstract

Introduction: Slow labor progression is one of the causes of dystocia, which leads to primary Cesarean section (C-section), assisted delivery, and related complications. This study aimed to determine the effect of acupressure at the Sanyinjiao point (SP-6) on labor duration.

Design: This was a single-blind clinical trial study conducted on 131 subjects.

Setting: This study was performed at Maryam Hospital, Tehran in 2009.

Intervention: The study population included women in the age range of 18 - 35 referred for term labor to the hospital labor department. The subjects were randomly divided into an experimental group (41 subjects) with pressure treatment at the SP-6 for 30 min and two control groups; one (41 subjects) receiving the touch treatment at the SP-6 for 30 min and the other receiving the conventional care (49 subjects).

Main Outcome Measure: Duration of the first and second stages of labor and total labor duration.

Results: Analysis of the mean duration of the first and second stages of labor between the three groups showed no statistically significant differences (P = 0.1, P = 0.5); however, the differences between the total length of labor duration were significant (P = 0.05). We found no significant differences between the three groups in the mode of delivery (P = 0.5).

Conclusion: The pressure at the Sp6 can be regarded as a possible effective technique to reduce the duration of labor.

Keywords: *Acupressure; SP-6; Labor Duration; Delivery*

Introduction

Slow labor progression is one of the causes of dystocia, which can lead to primary Cesarean section (C-section), assisted delivery, and related complications [1]. Shortening the duration of labor is an essential aspect of obstetric care and a highly desirable objective of intrapartum care for the birth service providers [2]. Government policy recommends that women who enter in on labor or go into labor

spontaneously need to increase and the number of labor interventions, such as Induction of labor, needs to be reduced increased rates of pharmaceutically induced labor and other interventions have been reported in many advanced countries, since the early 1990s [3]. Also, some non-pharmacological, non-invasive techniques to stimulate uterine contractions that are simple, safe, effective, and without serious side effects may prove beneficial for both mother and fetus [3]. These techniques include acupuncture and acupressure, muscle relaxation, breathing techniques, aqua therapy, music therapy, touch and massage therapy, supportive methods, heat and cold therapy, homeopathy, osteopathy, herbal medicine, hypnotherapy, sports [4].

According to systematic reviews, the effects of many of such approaches have not yet been determined by well-designed studies [5]. Acupressure is a traditional Chinese home-based therapy. It involves the application of constant pressure, rather than needles, at special acupoints from selected anatomical sites, usually applied by using the hands, fingers, or thumbs [6]. Few studies have been done on the effect of acupressure on labor out comes such as labor duration and mode of delivery. As a result, more studies are needed to establish the safety and effectiveness of this method.

Aim of the Study

The goal of this study was to evaluate the effect of acupressure on labor duration and mode of delivery in three groups of women during labor.

Methods

Study design

This experimental study was a single-blind clinical trial with a random allocation. Subjects were not aware of the methodology (pressure or touch) to be used.

Setting and participants

This study was conducted at Maryam Hospital, Tehran (Iran) from January to November 2009.

The study population consisted of 18 - 35 year-old women who had been referred to the hospital labor department for delivery with the required criteria for the study: Singleton pregnancy; parity of 1 or 2; 38 - 42 weeks gestation age based on a reliable LMP and/or a sonogram under 20 weeks; cervical dilatation of 3 - 5 cm; normal pattern of contractions repeated every 5 min or less for 20 sec or more; no use of psychotherapeutics; no use of chemical or the natural pain killers before the study; devoid of any medical or obstetrical problems. Individuals who were reluctant to cooperate and those with fetal distress concentrated meconium excretion, prolonged or rapid delivery, or whose baby's weight was not within the normal range were excluded from the study.

Pilot study

Initially, we conducted a pilot study on 30 individuals. The Acuhealth TENS Pro 900 (Acuhealth Pty, Stepney, South Australia) was used to confirm the accuracy of the Acupoint location. This device produces a different sound at acupoints due to their lower electric resistance than the surrounding area. At the point located, we performed the intervention according to the study conducted by Lee., *et al* [7].

After determining the pressure point with the help of 5000 Force Gauge, which has both European CE marking and ISO 9001 calibration, we applied pressure at the SP-6.

In the pilot study, we calculated the average pressure to be 1824 grams that is equal to the pressure needed to pale half of the nail of the researcher's thumb.

Randomization and interventions

The sample size of each group was determined to be 41. The method used to calculate the sample size included the unpaired t-test by employing the pretreatment and post-treatment data from Lee., *et al*.'s study [5]. We assumed the significance level and the test power to be 5% and 80.0%, respectively. Initially, the researcher randomly enrolled 172 participants that were referred to the Maryam hospital in Tehran. In the study, Due to limitations in space in the labor room, if the sampling of different groups was performed on the same day, the subjects would become aware of the used method, and thus, the placebo effect would be lost. Therefore, the randomization was performed in terms of time (fortnightly), at the beginning of each two weeks, and one of the groups was selected randomly. Finally, 131 mothers completed the study, that 21 subjects from the experimental group (pressure), 5 from the first control group (touch), and 15 subjects from the control group (conventional care) were excluded, during and after the intervention due to reasons such as prolonged or precipitate delivery, macrosomia, low birth weight, decelerations, thick meconium staining, and lack of consent. Ultimately, 131 individuals, consisting of 41 subjects in the pressure group, 41 in the touch group, and 49 in the conventional care group, were studied. The group with touch therapy at the SP6 was designed to eliminate the psychological effect of the researcher's presence at labor.

The intervention technique was as follows. In a 30-minute intervention, the experimental and first control groups simultaneously received pressure and light touch at the SP6 on both legs with deep breathing and relaxation. In the experimental group, the pressure was applied in a rotating fashion (the energy distributing method) at the SP-6 as follows: At first, a 2-minute pressure was applied in such a way to make subject experience a pleasant feeling of pain. Care was taken to keep the degree of the paleness of the nail at a constant level to make the subject relived by the pressure. Subsequently, regardless of contractions, one minute of pressure followed by a minute's rest was applied intermittently until the pressure-time equaled an overall of 30 minutes. It took one hour to perform this technique every time. Likewise, the same technique was applied in the first control group with a touch procedure instead of the pressure at the SP-6. Given the approximate average of 24 minutes [2] needed for Meridian's energy-flow cycle in the body, a pressure-time of 30 minutes was designed to guarantee complete circulation throughout the body. All the subjects in both experimental and first control groups were placed in a left lateral position to prevent blood pressure drop.

Measurements

We collected the demographic and obstetrical data through the complete questionnaire by interviewing every subject. Labor duration was documented in the subjects' questionnaires in a two-time period (the first period, dilatation of 3 cm to complete cervical dilatation and the second period, from complete cervical dilatation to the delivery time).

The cervical dilatation was measured before and then at one-hour intervals after the start of the intervention.

Statistical analysis

The collected data were analyzed using SPSS 19 software and descriptive statistics. The chi-square and Fisher's exact tests were used to analyze the categorical variables, while the ANOVA test was used to measure the following continuous variables: Age, dilatation, and effacement between the groups. The P-values below 0.05 were considered significant.

Ethical considerations

This study was approved by the Medical Ethics Committee of TMU, which was derived from the master thesis by Parisa Samadi, Grant NO: 150#75148, and registered in the Iranian Registry of Clinical Trials (ID: IRCT138812193527N1).

After explaining the study objectives to the participants, and informed consent was obtained from eligible participants who agreed to the study procedures.

Findings

Baseline characteristics

Initially, 172 women were randomly selected. Ultimately, 131 individuals, consisting of 41 subjects in the pressure group, 41 in the touch control group, and 49 in the conventional care group, were studied (Figure 1). All women were married and lived with their spouses. We used a one-way ANOVA test to compare the mean age of mothers in the three groups. The average age of the women in all three groups was (24 ± 3.6) years with no statistically significant differences between the three groups (P = 0.7, F = 0.32). We used Kruskal-Wallis test to compare the mean of cervical dilatation and effacement at the beginning of admission between the three groups. Before the intervention, no statistically significant differences were observed between dilatation and effacement in the three groups (p > 0.05). As presented in table 1, there was no significant difference in individual and obstetrical characteristics among the three groups. Also, the groups were similar in receiving prenatal care and use of oxytocin to facilitate the delivery (P > 0.05).

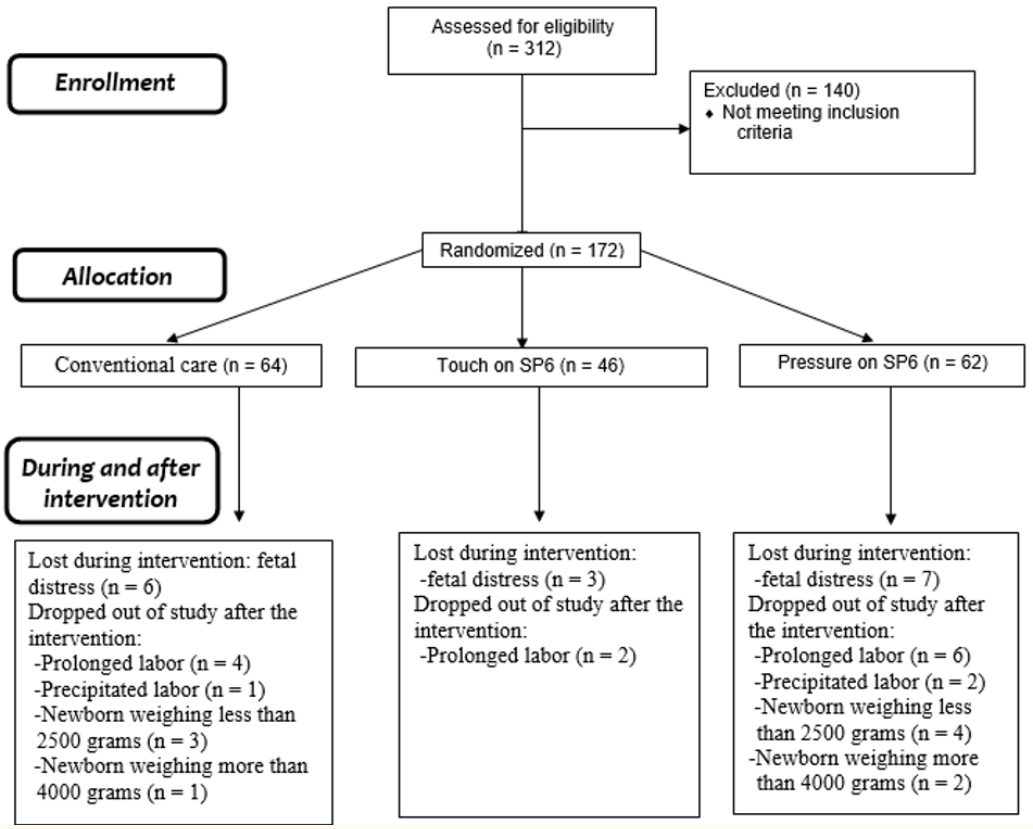

Figure 1: *Participants' flow diagram*

Characteristics		Pressure N (%) and Mean ± SD	Touch N (%) and Mean ± SD	Conventional care N (%) and Mean ± SD	Statistical Results	P value*
Parity	1	28 (68.3)	28 (68.3)	35 (71.4)	χ^2: 0.14	0.94
	2	13 (31.7)	13 (31.7)	14 (28.6)		
	Total	41(100)	41(100)	49(100)		
Amniotic membrane	Ruptured	28 (68.3)	26 (70.7)	34 (69.4)	χ^2: 0.05	0.92
	Intact	13 (31.7)	15 (29.3)	15 (30.6)		
	Total	41(100)	41(100)	49(100)		
Effacement		3.45 ± 0.57	3.45 ± 0.52	3.57 ± 0.71	F: 0.58	0.56
Dilatation		48.04 ± 12.08	50.24 ± 12.89	50.51± 12.35	F: 0.49	0.62

Table 1: *The comparison of baseline characteristics in the groups.*

We used Chi-Square test to compare parity and ruptured membranes in the three groups. The test results showed that there was no statistically significant difference between the three groups in terms of parity and ruptured membranes (P = 0.93).

Duration of the first and second stages

We used one-way ANOVA test to compare the duration of the first stage of labor between the three groups. The mean duration of the first stage of labor was lower in the experimental group (pressure) but the results showed that the difference between the three groups was not statistically significant (P = 0.1). We used Kruskal-Wallis test to compare the duration of the second stage of labor between the three groups. The mean duration of the second stage of labor was lower in the experimental group (pressure) but the results showed that the difference between the three groups was not statistically significant (P = 0.59).

To compare the mean of the total duration of labor between the three groups, a one-way ANOVA test was used and the test results showed that the difference between the three groups was statistically significant (P = 0.05). We used the Tukey test to examine the difference between which two groups. The results showed that: the total duration of labor was lower in the experimental group (pressure) and the results showed that the difference between the experimental groups (pressure) and control 1 (touch) was statistically significant (P = 0.03).

Groups / Variable	Pressure	Touch	Conventional care	P value
First stage of labor	200.1 ± 68.9	234.1 ± 72.4	217.8 ± 71.08	0.1[a]
Second stage of labor	30.5 ± 26.2	41.6 ± 40.04	36.3 ± 36.7	0.5[a]
Overall duration of labor	230.6 ± 67.9	276.2 ± 84.08	253.8 ± 91.09	0.05[a]

Table 2: *Comparison of mean and standard deviation of labor duration (minutes) between the three groups.*

[a]*: Analysis of variance.*

Mode of delivery

The effect of the intervention on the mode of delivery was evaluated using the exact test, which revealed no significant difference among the three groups (P = 0.5) (Table 3).

Groups Mode of delivery	Pressure N (%)	Touch N (%)	Conventional care N (%)	P value
Vaginal delivery	39 (95.1)	40 (97.6)	46 (93.9)	0.4.7[a]
Cesarean section	2 (4.9)	1 (2.4)	3 (6.1)	
Total	41 (100)	41 (100)	49 (100)	

Table 3: *Comparison of the frequency distribution of mode of delivery between the three groups.*

Discussion

The purpose of this study was to evaluate the effect of acupressure at the SP-6 on labor duration and mode of delivery. The results showed that the average duration of the first stage of labor was shorter in the pressure group, no statistically significant difference was found between the three groups in the duration of the first and second stages of labor. However, there was a statistically significant difference in the overall duration of labor between the three groups. The effect of the intervention on the mode of delivery was evaluated using the exact test, which revealed no significant difference among the three groups and the effect of the intervention on the mode of delivery was revealed no significant difference among the three groups.

Also, Park., *et al*. found that the average duration of the first and second stages of labor had no statistically significant relationship in the test and control groups. But, the results of this part of his study were not consistent with those of the present study as the comparison results of the overall duration of labor were significant between the three studied groups. In the study by Park, the first and second stages of labor were not assessed separately and no exact statistical results were obtained. The difference between the findings could be due to differences in the methodologies used [8].

Furthermore, a study by Lee in 2003 found that the labor duration in the pressure group was significantly lower than in the touch group [7]. The comparison between the findings of the two studies showed similarities in the results of the overall duration of labor despite the differences in the studied groups and methodologies used. In his study in 2004, Lee showed a shorter duration of the first stage of labor in the pressure group than the control group without any significant differences in the second stage. The overall duration of labor was shorter in the group with pressure at the SP-6 than in the control group [9]. These results confirmed the present study results regarding the second stage and the overall duration of labor.

Another study was conducted by Yesilcicek Calik., *et al*. on the effect of pressure at the SP-6 on the duration of labor, which was a random clinical trial on 100 primigravida women. The duration times of phase one (3 cm dilatation to full dilatation) and phase two (full dilatation to birth) in the acupressure group were shorter than the control group (phase one, 225 min and 320 min, respectively; phase two, 15 min and 20 min, respectively [10]. Compared to findings of the present study, the results by Lee MK and Yesilcicek Calik were obtained without considering the factors such as effacement, which is a determining factor in the progression rate of the first stage of labor. Furthermore, the duration of applied pressure was not identical for all subjects due to the application of pressure during the contractions. Moreover, the duration and frequency of contractions were not regarded, which can affect the progression of labor. However, all the above factors were considered in the present study.

A comparison between their results and the present study revealed that the application of acupressure at the SP-6 can be effective for the duration of labor regardless of the timing (latent or active phase of labor).

Another variable evaluated in the present study was the comparison of the mode of delivery in the studied groups, which results suggested that the three groups were not significantly different in the mode of delivery. In concordance with these findings, Ozgoly and

colleagues reported no significant differences in the delivery method among the three groups [5]. Akbarzadeh., *et al*. (2014) claimed that the normal vaginal delivery rate in the experimental group was significantly higher than the control group [11]. This is different from the results of the present study. The differences between the two studies involved different ways of application of pressure, non-considering the inclusion criteria such as duration and frequency of contractions and the exclusion of C-section cases.

In the study by Lee, the pressure was applied during contractions, which would lead to different pressure times for different subjects. But, in the present study, the pressure times were identical for all the subjects. In contrast to the present study, another study mentioned no statistically significant differences between the groups in terms of labor duration [12]. It is thus understood that the effects of acupressure on the labor duration differ in some studies. Yet, none of the studies reported any side effects of acupressure applied to humans. The different sample sizes and the use of different methodologies may be responsible for conflicting results.

The differences in results of the present study compared to the previous studies could be due to factors such as the use of more consistent criteria (effacement, amount of sleep in the last 24 hours), more inclusion criteria (normal pattern of contractions with 20 or more seconds and the frequency of every five or fewer minutes). The strengths of the present study included the use of a single-blind method, two control groups, and the identical pressure times for all subjects in the test group as well as the use of measurement devices for pressure and instruments to confirm the correct point of the pressure, both of which had the international CЄ marking of Europe.

World Health Organization has stated that there was "no justification for any region to have a caesarean section (CS) rate higher than 10 - 15 percent [13]. Unfortunately, based on the results of a Systematic Review in Iran, the prevalence of Cesarean was estimated at 48% [14].

As the limitations of this study, oxytocin administration was one of the hospital routines that was performed on all three groups in a similar style and timing. The strengths of this study, Converse to other studies, more matching and inclusion criteria were considered in the study's design. Also, identical pressure time for all women in the interventional group was applied. The use of a single-blind design, two control groups, measurement tools for pressure, and special tools to confirm the correct point of pressure were the strengths of this study.

Conclusion

In addition, the current findings showed that the application of this technique is an effective and complementary method for shortening the labor duration, which in turn would decrease complications due to prolonged labor, C-section and assisted vaginal delivery. Therefore, given the facts, this technique can be regarded as an easy, cost-effective, non-invasive, and complementary method to be used in labor. By teaching this method and its application to the midwifery staff and even the pregnant women, we can encourage women to make the right choice of having a vaginal delivery. As a result, the findings of this study can contribute to the promotion of women's health and help reduce the unnecessary costs imposed by surgery.

Acknowledgements

The study was approved by the Medical Ethics Committee of TMU, which was derived from the master thesis by Parisa Samadi, Grant NO: 150#75148.

Financial Support and Sponsorship

Tarbiat Modares University, Tehran, Iran.

Conflicts of Interest

Nothing to declare.

Bibliography

1. Harrison MS., *et al*. "A prospective population-based study of maternal, fetal, and neonatal outcomes in the setting of prolonged labor, obstructed labor and failure to progress in low- and middle-income countries". *Reproductive Health* 12.2 (2015): S9.
2. Makvandi S., *et al*. "Meta-analysis of the effect of acupressure on duration of labor and mode of delivery". *International Journal of Gynecology and Obstetrics* 135.1 (2016): 5-10.
3. Mollart LJ., *et al*. "Impact of acupressure on onset of labour and labour duration: A systematic review". *Women and Birth: Journal of the Australian College of Midwives* 28.3 (2015): 199-206.
4. Tournaire M and Theau-Yonneau A. "Complementary and alternative approaches to pain relief during labor". *Evidence-Based Complementary and Alternative Medicine* 4.4 (2007): 409-417.
5. Ozgoli G., *et al*. "Effect of LI4 and BL32 acupressure on labor pain and delivery outcome in the first stage of labor in primiparous women: A randomized controlled trial". *Complementary Therapies in Medicine* 29 (2016): 175-180.
6. Robinson N., *et al*. "The evidence for Shiatsu: a systematic review of Shiatsu and acupressure". *BMC Complementary and Alternative Medicine* 11.1 (2011): 88.
7. Lee MK. "[Effects of San-Yin-Jiao(SP6) acupressure on labor pain, delivery time in women during labor]". *Taehan Kanho Hakhoe Chi* 33.6 (2003): 753-761.
8. Park Y., *et al*. "The effect of San-Yin-Jiao (SP6) acupressure on labor progression (2003).
9. Lee MK., *et al*. "Effects of SP6 acupressure on labor pain and length of delivery time in women during labor". *Journal of Alternative and Complementary Medicine* 10.6 (2004): 959-965.
10. Yesilcicek Calik K and Komurcu N. "Effects of SP6 Acupuncture Point Stimulation on Labor Pain and Duration of Labor". *Iranian Red Crescent Medical Journal* 16.10 (2014): e16461.
11. Akbarzadeh M., *et al*. "Comparison of the effects of maternal supportive care and acupressure (BL32 acupoint) on pregnant women's pain intensity and delivery outcome (2014): 129208.
12. Mucuk S and Baser M. "Effects of noninvasive electroacupuncture on labour pain and duration". *Journal of Clinical Nursing* 23.11-12 (2014): 1603-1610.
13. Betran AP., *et al*. "What is the optimal rate of caesarean section at population level? A systematic review of ecologic studies". *Reproductive Health* 12.1 (2015): 57.
14. Azami-Aghdash S., *et al*. "Prevalence and Causes of Cesarean Section in Iran: Systematic Review and Meta-Analysis". *Iranian Journal of Public Health* 43.5 (2014): 545-555.

Volume 4 Issue 3 March 2022