



Asian Journal of
**Information
Management**

ISSN 1819-334X



Academic
Journals Inc.

www.academicjournals.com

If Different Acupressure Points have the same Effect on the Pain Severity of Active Phase of Delivery among Primiparous Women Referred to the Selected Hospitals of Shiraz University of Medical Sciences, 2010

¹Marzieh Akbarzadeh, ²Zahra Moradi, ³Najaf Zare, ⁴Mohammad Javad Hadian Fard and ⁵Azam Jowkar

¹Community Based Psychiatric Care Research Center, Department of Midwifery, Fatemeh (P.B.U.H), School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

²Instructor of Midwifery, School of Nursing and Midwifery, Fasa University of Medical Science, Fasa, Iran

³Department of Biostatistics, Infertility Research Center, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

⁴Department of Physical Medicine and Rehabilitation Specialist, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

⁵Instructor of Midwifery, School of Nursing and Midwifery Fatemeh (P.B.U.H), Shiraz University of Medical Sciences, Shiraz, Iran

Corresponding Author: Marzieh Akbarzadeh, Community Based Psychiatric Care Research Center, Department of Midwifery, Fatemeh (P.B.U.H) School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

ABSTRACT

Labor pain and its relieving methods is one of the anxieties of mothers having a great impact on the quality of care during delivery as well as the patients' satisfaction. The propensity of using non-medicinal pain relief methods is increasing. The present study aimed to compare the effect of Acupressure at two GB-21 and SP06 points on the severity of labor pain. In this quasi-experimental single blind study started on December 2010 and ended on June 2011 in which 150 primiparous women were divided into three groups of Acupressure at GB-21 point, Acupressure at SP-6 point and control group. The intervention was carried out for 20 min at 3-4 and 20 min at 7-8 cm dilatation of Cervix. The pain severity was measured by Visual Analog Scale before and immediately, 30 and 60 min after the intervention. Then, the data were statistically analyzed. No significant difference was found among the 3 groups regarding the pain severity before the intervention. However, the pain severity it was reduced at 3-4 and 7-8 cm dilatation immediately, 30 and 60 min after the intervention in the two intervention groups compared to the control group ($p < 0.001$). Nonetheless, no statistically significant difference was observed between the two intervention groups ($p = 0.93$). The results of the study showed that application of Acupressure at two GB-21 and SP-6 points was effective in the reduction of the severity of labor pain. Therefore, further studies are recommended to be performed on the application of Acupressure together with non-medicinal methods.

Key words: Acupressure, pain severity, active phase of delivery

INTRODUCTION

Labor pain is a complex, personal, mental, multi-phase phenomenon that is influenced by psycho-cognitive, bio-cognitive, cultural, social and economic factors. In addition, adaptability with

pain is effective in the severity and amount of pain experienced by the parturient (Fraser and Cooper, 2003). Studies have shown that fear and anxiety resulting from delivery increase the patient's pain and inconvenience in the delivery room and its continuity during labor affects the respiratory system, blood circulation, endocrine glands and other body functions (Amilton, 2004; McCrea *et al.*, 2000; Loser *et al.*, 2001). Yet, another outcome of fear is the increase of elective cesareans (Lowe, 1996). When mother is having pain and is under the resultant stress of the therapeutic measures, the sympathetic system is in the continuous stimulus position. The continuity of such conditions for a longer period of time causes the stimulating situation to reach a point that affects the adaptative mechanisms. Moreover, severe anxiety of the mother while the delivery stages increases the secretion of catecholamine's specially adrenalin and noradrenalin by stimulating the humoral and autonomic nervous systems eventually leading to the increase of pulse rate and Systolic Blood Pressure (SBP) (Lowe, 2002).

Considering what was mentioned above, it is necessary to pay special attention to labor pain and make use of safe and simple methods which are not accompanied by side-effects. Recently, non-medicinal methods especially acupressure have been considered to control the pain. Acupressure is actually among the complementary medicine treatments and one of the branches of acupuncture in which the hand or finger pressure is used instead of needles (Waters and Raisler, 2003; Lee *et al.*, 2004). Acupressure is based on the theory of movement of vital energy circulation in some circuits throughout the body (Beal, 1999; Park *et al.*, 2003). Thus, exerting finger pressure on specific points of these circuits will help remove the obstruction or improve the vital energy circulation in the circuits in cases of decrease or increase of energy movement. The patients feel more pain and pressure at these points while stimulation. According to the gate control theory of pain, stimulating skin via massage, needle and itching leads to stimulation of large fibers that transmit the nervous impulses to the spinal cord. If this stimulation is continued, it could cause the transmission gates to remain closed eventually reducing the feeling of pain (Setax and Pomeranz, 2006).

There are several pressure points in the body for induction and reduction of labor pain. It is believed that stimulating these points will lead to release of oxytocin from the hypophysis and stimulation of uterine contractions resulting in development of labor. In the other words, it leads to energy equilibrium and reduction of labor pain (Cook and Wilcox, 1997).

SP-6 point is among these points which is situated in both feet at a distance of 4 fingers above Malleolus behind Tibia and its stimulation is effective in pain reduction (Beal, 1999; Lee, 2003). According to the researches, applying acupressure on SP-6 point is effective in pain reduction (Beal, 1999; Park *et al.*, 2003; Lee, 2003; Skilnand *et al.*, 2002). Another point which causes the reduction of labor pain is GB-21 which is situated in the middle of the hypothetical line between the shoulder projection and the 7th vertebra of the neck. However, during the recent 10 years, no studies have been carried out regarding the use of this point.

Chung *et al.* (2003) conducted a study to determine the influence of pressure and palpation on the severity of labor pain and uterine contractions and found that exerting pressure on BL-67 and LI-4 points significantly reduced the pain.

Besides, Qu and Zhou (2006) showed that electro-acupuncture on Hugo and SP-6 points was effective in pain relief.

Chao *et al.* (2007) also performed a study to assess the effect of Transcutaneous Electrical Nerve Stimulation (TENS) at Hugo and Saninjiao points on pain severity and delivery duration. The results of that study showed that the mean of pain severity in the intervention group was

significantly lower than that of the placebo group. However, no difference was found between the two groups regarding the duration of the active phase of delivery (Chao *et al.*, 2007).

Although the above-mentioned studies have confirmed the effect of acupressure on the reduction of labor pain, the results of the research by Ziaei and Hadjipour (2006) showed that stimulation of 6 acupressure points had no influence on reduction of the delivery pain.

It is necessary to mention that none of the performed researches has evaluated the rate of pain severity until the end of the delivery stages and at two acupressure points. Therefore, considering the fact that no sufficient clinical trials have been conducted to assess various aspects of acupressure in midwifery, the present study aimed to investigate the effect of acupressure at GB-21 and SP-6 points on the pain severity of the active phase of delivery among primiparous women.

MATERIALS AND METHODS

The present quasi-experimental, single-blind was conducted on 150 primiparous women with term pregnancy and labor pain who were hospitalized at selected hospitals of Shiraz. The inclusion criteria of the study were being primiparous, being 18-35 years old, single pregnancy, gestational age of 37-41 weeks, cephalic position of the fetus, being at the beginning of the active phase of delivery (3-4 cm dilatation) or before, not suffering from psychological disorders and anatomical and chronic diseases (cardiac, pulmonary, hypertension and diabetes), non-existence of risky pregnancies, not suffering from skin inconveniences, such as Eczema and epidermis infections, which are among the limitations for doing acupressure and not having used oxytocin for induction of labor. Also, in case the mothers presented with any type of maternal or neonatal problems that resulted in cesarean or supporting contractions by oxytocin, they were excluded from the study.

The study subjects were divided into three groups through lottery. Acupressure intervention was done at GB-21 point for the 1st group, while at SP-6 point for the 2nd group. Besides, the 3rd group was considered as the control group. In order to prevent the effect of the psychological aspects of various interventions on the research results, only one type of intervention was carried out per day. The intervention was specified through lottery and the location of intervention was changed every other day.

Before beginning the intervention, the hospitalized pregnant women were evaluated regarding the inclusion criteria of the study. In case they met the criteria, they were provided with the necessary explanations regarding the study. After obtaining written informed consents, the intended interventions were performed regarding the date of entering the study.

After performing vaginal examination by the researcher, pressure exertion was begun for the experimental groups as the contractions started at 3-4 cm dilatation. In group 1, the pressure was exerted by the thumb of the right hand on GB-21 point of the left shoulder and the thumb of the left hand on GB-21 point of the right shoulder. For group 2, on the other hand, the pressure was exerted by the thumb of the right hand on SP-6 point of the left foot and the thumb of the left hand on SP-6 point of the right foot for a period of 30 sec. Then, rest was taken for 30 sec while the thumb finger was still in contact with the acupressure point. Pressure exertion was continued for 20 min. After that, vaginal examination was performed every 2 h so as to do the intervention again in 7-8 cm dilatation for 20 min. The pain severity was measured by VAS before and immediately, 30 and 60 min after the intervention in both groups.

The severity of pain was also evaluated in the control group at 3-4 cm dilatation. Thereafter, the contact was taken place for a period of 20 min at GB-21 point and the severity of pain was

measured immediately, 30 and 60 min after the contact. Then, vaginal examination was carried out every 2 h and at 7-8 cm dilatation, the contact was performed at SP-6 point for a period of 20 min and again the severity of pain was evaluated immediately, 30 and 60 min after the intervention.

In this study, 1710 and 1350 mmHg pressures were simultaneously exerted under the thumb of the right hand and under the thumb of the left hand, respectively and pressure exertion was repeated using a digital scale to minimize the difference in the amount of pressure.

The study data were collected using a demographic information questionnaire and Visual Analogue Scale (VAS). This scale is numbered from 0 to 10 with 0, 1-3, 4-6, 7-9 and 10 representing no, mild, average, severe and very severe pain, respectively. Its internal consistency was confirmed, as well (80%). In the study, the validity of VAS was confirmed by asking the specialists' opinions and its reliability was confirmed with Cronbach's alpha = 80%. Overall, researchers have shown that VAS possesses a good validity for evaluation of pain severity and has been frequently applied in various researches (Chao *et al.*, 2007).

After encoding the study variables, the data were entered into the SPSS statistical software. Independent t-test, one-way ANOVA, repeated measures ANOVA and Chi-square tests were used to analyze the study data.

RESULTS

The results showed that the mean age of research subjects was 25.52 ± 4.27 years. In addition, 69.34, 41.33 and 30.66% of the participants had below diploma, diploma and academic degrees, respectively. Besides, the mean gestational age was 38.52 ± 0.84 weeks. The results of one-way ANOVA and Chi-square tests showed no significant difference among the three groups regarding age, education level and gestational age.

Regarding the rate of pain severity, the results of repeated measures ANOVA showed a statistically significant difference between the severity of labor pain before the intervention and immediately, 30 and 60 min after the intervention in the 3 groups at 3-3 and 7-8 cm dilatation of cervix ($p < 0.001$).

According to the results of one-way ANOVA, no significant difference was found among the three groups regarding the pain severity before the intervention at 3-4 and 7-8 cm dilatation ($p > 0.05$). However, the severity of pain was significantly reduced in both experimental groups after the intervention in comparison to the control group ($p < 0.001$). Nonetheless, no statistically significant difference was observed between the two experimental groups concerning the pain severity ($p > 0.05$). Comparison of the means of pain severity at 3-4 cm dilatation showed that the mean pain severity was reduced in the experimental groups after the intervention and the highest reduction rate was related to immediately after the intervention (6.30 ± 1.21 and 4.94 ± 1.59 before and after the intervention respectively at GB-21 point and 6.20 ± 1.71 and 4.92 ± 1.99 before and after the intervention respectively at SP-6 point). This pain severity reduction continued until one hour after the intervention. At 7-8 cm dilatation, the reduction of pain severity continued only until 30 min after the intervention. In the control group, on the other hand, the severity of pain increased and the highest rate of pain severity was reported 60 min after the intervention (Table 1, 2 and 3).

Table 1: Comparing the mean of severity of labor pain before, immediately, 30 and 60 min after intervention in case and control groups at 3-4 cm dilatation

	Group						
	GB-21 double stages (group 1)		SP-6 double stages (group 2)		Control (group 3)		p-value
Pain severity	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Before intervention	6.30	1.21	6.20	1.71	6.24	1.70	p<0.001
Immediately after intervention	4.94	1.59	4.92	1.99	6.18	1.91	
30 min after intervention	5.42	1.66	5.40	1.97	7.06	1.87	
60 min after intervention	5.92	1.74	5.96	1.87	7.90	1.84	

Table 2: Comparing the mean of severity of labor pain before, immediately, 30 and 60 min after intervention in case and control groups at 7-8 cm dilatation

	Group						
	GB-21 double stages (group 1)		SP-6 double stages (group 2)		Control (group 3)		p-value
Pain severity	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Before intervention	9.24	0.43	9.20	0.75	9.20	0.94	p<0.001
Immediately after intervention	7.12	1.28	7.18	1.30	9.04	1.04	
30 min after intervention	7.58	1.20	7.66	1.40	9.44	0.88	
60 min after intervention	9.52	0.54	9.52	0.54	9.90	0.49	

Table 3: Comparing the mean of severity of pain among two case groups at two stages of intervention.

	Group								
	Before intervention		Immediately after intervention		30 min after intervention		60 min after intervention		p-value
Pain severity	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Double stages-GB-21 (gr. 1)	6.30	1.21	4.94	1.59	5.42	1.66	5.92	1.74	0.93
Double stages SP-6 (gr. 2)	6.20	1.71	4.92	1.99	5.40	1.97	5.96	1.87	
Double stages GB-21 (gr. 1)	9.24	0.43	7.12	1.28	7.58	1.20	9.52	0.54	0.68
Double stages SP-6 (gr. 2)	9.20	0.75	7.18	1.30	7.66	1.40	9.52	0.54	

DISCUSSION AND CONCLUSION

Up to now, no studies have been conducted on determination and comparison of pain severity of delivery at the periodic sections of immediately, 30 and 60 min after the intervention at two stages of 3-4 and 7-8 cm at two acupressure points. Also, a limited number of studies have compared the effect of acupressure on the pain severity of delivery at two different points. Therefore, comparison of all the study results with the previous studies may not be possible.

Based on the results of the present study, application of acupressure could be accounted as an effective method in reduction of pain severity of delivery; however, the two acupressure points (GB-21 and SP-6) had no difference in reduction rate of the pain severity. Comparison of the means showed that the reduction of pain severity continued until 60 min after the intervention in the two experimental groups at the 1st stage (3-4 cm dilatation).

In their study on the effect of acupressure at SP-6 on the severity of pain and delivery duration, Lee *et al.* (2004) measured the severity of pain in four periodic sections namely before the intervention and immediately, 30 and 60 min after the intervention. The intervention involved 30 min pressure or palpation of SP-6 point after 3 cm dilatation during each contraction. That study revealed a significant difference between the two experimental groups and the control group regarding the pain severity immediately ($p = 0.12$), 30 min ($p = 0.12$) and 60 min after the intervention ($p = 0.12$); such a way that the severity of pain in the experimental group was less than that of the control group. These results were similar to those of the present study (Lee *et al.*, 2004).

In the current study, in the 2nd stage of the intervention (7-8 cm dilatation), the severity of pain was reduced only until half an hour after the intervention. In this stage, the severity of pain was more than that before the intervention and one hour after the intervention which is concurrent with the transmitting stage of labor (10 cm dilatation). Similar results were also obtained by Chang *et al.* (2006) showing no significant difference between the severity of pain before and after the intervention at 10 cm dilatation.

Therefore, considering the reduction of pain severity after application of acupressure, the results of the present study were similar to those of the researches carried out by Chung *et al.* (2003), Lee *et al.* (2004) and Chao *et al.* (2007).

In the study conducted by Hamilton and colleagues in 2010, 71 pregnant women received acupressure at spleen 6 point (sp-6) on both feet for 30 min (acupressure group), 71 pregnant women received light touch at sp-6 on both legs during the same period of time (touch group) and 70 pregnant women received the standard routine care (standard care group). The intensity of labor pain was assessed by visual analog scale in the three groups before and immediately, 30, 60 and 120 min after the intervention. Reduction of the labor intensity in the acupressure group was significantly lower compared to the other groups and highest rate of pain reduction was related to immediately after the intervention ($p < 0.001$) (Hjenlmstedt *et al.*, 2010).

It should be mentioned that in all the aforesaid studies, pressure exertion was carried out on Sanjiao point for 30 min and the pressure was exerted simultaneously with the uterine contraction which is different with the present study.

As time passes, the severity of pain and duration of contractions increase resulting in a higher pain severity (Tournaire and Theau-Yonneau, 2007). Considering the means of pain severity, in our study also, the severity of pain increased with the development of dilatation in all the 3 groups. In Lee *et al.* (2004) also, the pain increased in the study groups that confirms the results of the current research.

In this study, no significant difference was found between the two acupressure points regarding the pain reduction rate at the two stages of the intervention ($p < 0.001$). This might be due to the similarity of the mechanism of acupressure at various points and that the researcher performed the procedure correctly for both points, which is supposed to be the positive point of this study. Of course, more researches are required to be conducted on this issue. The results of this research were consistent with those of the study by Kim *et al.* (2002) comparing the effect of acupressure at two

SP-6 and LI-4 points on the severity of labor pain and duration of active labor. In that study, the subjects were divided into three groups of SP-6 acupressure, LI-4 acupressure and control group and compared regarding the severity of pain after the intervention. The study results revealed a significant difference between SP-6 and the control group as well as between LI-4 and the control group regarding the pain severity ($p < 0.05$). However, no significant difference was observed between the two interventional groups of SP-6 and LI-4 ($p > 0.05$) (Kim *et al.*, 2002).

According to the theory of gate control of pain, the acupressure mechanism can lead to stimulation of the large transmitter fibers of the nervous impulses to the spinal cord resulting in the closure of the pain transmission gates and reduction of pain (Lee *et al.*, 2004).

In spite of the available information regarding the effect of acupressure on the labor pain, the results obtained in this regard are controversial (Chung *et al.*, 2003) and consequently, further studies are needed to be conducted on the issue.

Overall, the findings of the present study indicated that application of acupressure at two GB-21 and SP-6 points could be accounted as one of the methods to reduce the pain severity of the active phase of delivery. Both acupressure points acted similarly in reduction of the severity of pain. Thus, this method is recommended to be applied instead of the medicinal methods of pain reduction. Of course, further studies are suggested to compare the effect of application of acupressure and other non-medicinal methods.

ACKNOWLEDGMENTS

The present article was extracted from Ms. Zahra moradi's M.Sc. thesis (proposal No. 6356, IRCT201108037217N1). The study was financially supported by the Research Vice-chancellor of Shiraz University of Medical Sciences, Shiraz, Iran. Hereby, the authors would like to thank the authorities of the college of nursing and midwifery and physicians and midwives of Shoushtari hospital, Shiraz, Iran. They are also grateful for Ms. A. Keivanshekouh at Research Improvement Center of Shiraz University of Medical Sciences for improving the use of English in the manuscript.

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