Effect of the Sanyinjiao Point (SP6) Acupressure on Reducing Labor Pain at Ismailia Governmental Hospitals

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ABSTRACT

Background: labor pain is often described as the worst pain in a woman's life, acupressure is one of non-pharmacologic methods can help women copes with the pain of labor. **Aim of the study**: was to assess the effect of sanyinjiao point (SP6) acupressure on reducing labor pain intensity. **Design**: a quasi-experimental design was adopted. **Setting:** data collected from two settings; delivery wards of the Suez Canal University Hospital and General Hospital in Ismailia City. **Sample**: convenience sample of 60 nulliparous women fulfilled the selection criteria were divided into interventional and control group. **Tools of data collection:** four tools; Structured Interview, Short form McGill pain questionnaire, Wong-Baker Faces Pain Rating Scale, and Investigation record were used. **Results**: there was statistical significance reduction of labor pain for study group compared to control group by using Wong Baker faces pain scales immediately, after 30 and 60 minutes from intervention. The mean difference of plasma cortisol level was 1.6±73.7 for interventional group versus 10.37±136.0 for control group with statistical significance differences (p=0.000) immediately after intervention. **Conclusions:** these findings showed that, SP6 acupressure was effective to decrease labor pain for nulliparous women during active phase of labor. **Recommendation:** involve application of SP6 acupressure procedure at labor ward as a part of nursing care.

Keywords: Labor pain, acupressure, SP6 points, Short form McGill pain questionnaire, plasma cortisol

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INTRODUCTION

Labor is the physiologic process by which a fetus is expelled from the uterus to the outside world. It is a time of change, both an ending and a beginning, for a woman, a fetus and her family. The mean duration of a human singleton pregnancy is 280 days or 40 weeks from the first day of the last menstrual period. The onset of labor is defined as regular ending, painful uterine contractions resulting in progressive cervical effacement and dilatation **(Gabbe et al., 2007; Berghella et al., 2008).**

The pain experienced in labor is affected by the processing of multiple physiological and psychosocial factors. Perceptions of labor pain intensity vary. Occasionally, women feel no pain in labor and give birth unexpectedly. At the other extreme labor, pain has been reported to be the most severe pain that a woman experiences in her lifetime. Labor pain results from uterine contractions, stretching of the cervix and pressure of the fetal presenting part on tissues of surrounding organs. In addition the perception of pain is in part, culturally determined by women who expressing their feelings by

screaming; believed that will reduce pain **(Pillitteri, 2010; Jones et al., 2012)**.

There is a positive correlation between the intensity of pain and increased plasma cortisol level and this disagrees with previous reports of a relationship of pain and lower blood cortisol levels. Cortisol is a steroid hormone released from the adrenal gland in response to ACTH, a hormone from the pituitary gland in the brain. Cortisol affects many different body systems. It plays a role in: bone,circulatory system,immune system,metabolism of fats, carbohydrates, and protein,nervous system and stress responses**(Domżał et al., 1983; Stewart& Krone, 2011)**jhgtjhk,..

There are many safe nonpharmacologic and pharmacologic choices for the management of pain during labor and birth, which may be used separately or combination with one another. Pharmacologic pain relief during labor includes systemic analgesia and regional analgesia/anesthesia which have become less common, while newer neuraxial analgesia/anesthesia techniques involving minimal motor blockade have become more popular **(Ricci&Kyle, 2009)**.

Non pharmacological measures include; relaxation, focusing and Imagery, breathing techniques, aromatherapy and essential oils, heat or cold application, bathing or hydrotherapy, therapeutic touch and massage, yoga and meditation, reflexology, crystal or gemstone therapy, transcutaneous electrical nerve stimulation (TENS), intracutaneous nerve stimulation (INS), acupressure and acupuncture **(Creehan, 2008; Cunningham et al., 2010; Jones et al., 2012).**

Acupressure is a traditional Chinese Medicine, in which meridians are a series of channels that carry Qi (energy) through the body. These meridians are a separate system from nerves, blood vessels and lymphatic ducts and contain over 600 points. In restoring and balancing the bodies energy through this meridian system, acupuncture and acupressure promote changes to improve the way the body functions. These acupressure points prompt the body to work more efficiently.

Acupressure is known to have long-lasting effects on pain in different body parts. Through elicit the release of morphine like substances (endorphins), serotonin or cortisol which can ultimately lead to pain relief and alter the physiological status. From a medical model, they can be viewed as promoting the release of endorphins, blocking the pain receptors to the brain, dilating the cervix, and increasing the efficiency of the contractions **(Vickers & Zollman, 2001; Sculte, 2006; Minowa, 2007; Rastogi, 2012)**.

Several acupoints have been used in reducing labor pain: Ciliao BL32, Yongquan KID-1, Hegu LI4, and Sanyinjiao SP6. SP6 or the meeting point of spleen, liver and kidney channels, is located on spleen meridian, which is four fingers above the inner ankle behind the posterior edge of tibia .

Spleen meridians runs across the anteromedial aspect of the inner thigh that runs across the dermatomic areas of L5, L4, L2 and L1, and then upward toward T12 to T5. Because the sympathetic nerves controlling the uterus through the pelvic plexus receive the preganglionic fibers out of T5 to L4. Sanyinjiao (SP6) point is considered promotion for labor progress, significantly decrease labor pain and the length of labor in women**.** Furthermore, acupressure is an appealing strategy, given that it is safe, cost effective, and easy to implement to use to manage labor pain **(Lee et al., 2004; Davidson et al., 2008; Charandabi et al., 2011; Shafaie et al., 2013; Black, 2014)**.

Nurses are in an ideal position to provide childbearing women with balanced, clear, concise information about nonpharmacologic and pharmacologic measures to relieve pain. Non-pharmacologic measures is a complementary or alternative therapies for pain relief that may be used either as a woman's total pain management program or to complement pharmacologic interventions. Most of non-pharmacologic interventions are based on the gate control theory concept that distraction can be effective in preventing the brain from processing pain sensations coming into the cortex **(Kuczkowski, 2007; Burns et al., 2007).**

Pain management standards issued by Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) mandate that pain be assessed in all clients admitted to a health care facility. Thus, it is important for nurses to be knowledgeable about the most recent scientific research on labor pain-relief modalities, to make sure that accurate and unbiased information about effective pain relief measures is available to laboring women, to be sure that the woman determines what is an acceptable labor pain level for her, and to allow the woman the choice of pain-relief method **(Ricci& Kyle, 2009)**.

Significance of the study

Labor pain is complaint of all women in labor, and its average intensity is high in 60% of women. Managing of pain that is one of nurses' roles is important to improve women's comfort and ensure their active participation during labor. Non-pharmacological measures to relive pain are safe, less side effect and can be used by nurses. A highlight on the new modalities of non-pharmacological pain relief measures is important to increase nurses' ability to managed labor pain safely and without medical prescription **(Smith et al., 2009; Ricci& Kyle, 2009)**. Acupressure as a non-pharmacological measure did not examine before in Suez Canal district.

Aim of the study

This study aimed to:-

Assess the effect of the Sanyinjiao point (sp6) acupressure on reducing the labor pain intensity.

Research hypothesis:

Nulliparous women who receive acupressure on SP6 point will have lower labor pain intensity than who do not.

SUBJECTS and METHODOLOGY

Research design

A quasi-experimental design was adopted to reach the stated aim (non-equivalent control group design).

Setting

Two settings were selected in this study; delivery wards in the Suez Canal University and General hospitals in Ismailia City.

Sample size

A purposive sample of 60 nulliparous women was recruited for this study. The sample was recruited based on inclusion criteria: age not exceeds 35 years; with singleton pregnancy; normal position and presentation; gestational age between 38 and 42 weeks of pregnancy cervical dilatation at 4cm and Proper contractions (at least three moderate contractions with a duration of 45–60 sec. in 10 min). Exclusion criteria: high risk pregnancies; receiving any sedation during labor; multiple gestation; intrauterine fetal death; abnormal position or presentation; signs of fetal distress; previous hysterotomy or uterine scar, and nulliparous women who

receive oxytocin. Thirty nulliparous women received the intervention and 30 nulliparous women were included as control group who received routine care.

Sample equation:

The sample size will be calculated according to the following equation:

$$n = \frac{(p_1 q_1) + (p_2 q_2)}{(p_2 - p_1)^2} \times f(alpha, power)$$

P Indicator for prevalence of Pain control

p1 = Pain control rate in acupressure group = 58%.

q1 = 1 – p1;

p2 = Pain control rate in control group = 14 %.

q2 = 1 – p2;

f = the value of (alpha, power) for a two-tailed test = 2.7

Based on the formula the sample size should be not less than 22 women for each group**(Wassertheil-Smoller,2004)**.

Tools of data collection

4 research tools were used to achieve the study aims.

I- **Structured Interview Tool** that developed by the researcher and consists of three parts as the following:

Part 1: Included demographic data as age, education level and occupation.

Part 2: Included past obstetrical history which included gravidity, abortions.

Part 3: Included present obstetrical history about gestational age, condition of membranes, cervical effacement and dilatation, uterine contraction frequency, duration and severity and fetal heart rate**.**

II- Lab. Investigation Record: it used to record results of analysis of plasma cortisol level before and immediately after the intervention.

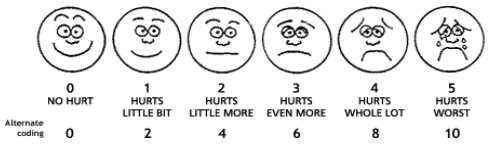
III- Short form McGill pain questionnaire: A short form version of the McGill Pain questionnaire (SF-MPQ) consists of three parts:

Part 1: *Quality of Pain:* contains a total of 15 descriptors; 4 affective and 11 sensory which are rated on an intensity scale: 0 = None, 1 = Mild, 2 = Moderate and 3 = Severe.

Part 2: *Visual Analogue Scale:* a 10-centimeter horizontal line with clearly defined boundaries with descriptive ranging from "no pain"=0 to the "worst possible pain"=10.

Part 3: *Present Pain Intensity:* is a six-point verbal rating scale. It consists of six words, from none (0), mild(1), discomforting(3), distressing(4), Horrible(5) to the worst excruciating(6)

IV-Wong-Baker Faces Pain Rating Scale: it explain to the person that each face is for a person who feels happy because he has no pain (no hurt) or sad because he has some or a lot of pain. Face 0 is very happy because he doesn't hurt at all. Face 1 hurts just a little bit. Face 2 hurts a little more. Face 3 hurts even more. Face 4 hurts a whole lot. Face 5 hurts as much as you can imagine, although you don't have to be crying to feel this bad. Ask the person to choose the face that best describes how he is feeling**(Hockenberry et al., 2009)**.



Content validity

Tools were submitted to a panel of 5 experts; two experts in the field of Maternity Obstetrics and Gynecology Nursing and three experts in the field of Obstetrics and Gynecology medicine to test the content validity. Modifications were carried out according to the panel judgment on clarity of sentences and appropriateness of content.

Ethical considerations

Orally approval was obtained from the nulliparous women and informed about the nature, process, and expected outcomes of the study, Reassured that, the study was safe, assured them that information obtained was confidential and was used only for the purpose of the study and informed about her rights to withdraw at any time she want throughout the study.

Pilot study

Pilot study was carried out on 10 % of the sample (6 of nulliparous women) who were excluded from study sample in order to assess the feasibility and clarity of the tools and determine the needed time to answer the questions. The pilot study lasted for 1 month. Based on its result minimal changes were carried out. The pilot study revealed that, the importance of objective data (plasma Cortisol level and Wong-Baker Faces Pain Rating scale). `

Procedure

Data collected through a period of 4 months from beginning of September 2013 to the half of December 2013. Data were collected four days every week (Sunday, Tuesday, Thursday &Friday) from General hospital and two days (Saturday& Monday) from Suez Canal University hospital from 10 am to 7 pm. The researcher finished the interventional group first and then control group.

Preparatory phase: The researcher trained under supervision of physiotherapist to become skilled in the manual massage of acupressure points before conducting the study. An official letter was issued from the Faculty of Nursing, Suez Canal University to the directors and heads of delivery wards of the Suez Canal University and General hospitals in Ismailia city to obtain their permission to conduct the study. Data collected through four phases which are; interviewing; assessment; implementation and evaluation phase.

1) Interviewing phase: the researcher recruited Nnulliparous women who accepted to be included in the study in both groups were interviewed at the labor unit to collect data related to demographic and present obstetrical history. The researcher was facing the nulliparous woman, asked her the questions in Arabic and recorded her answers in the Structured Interview Tool. The interview consumed about 15 minutes for each nulliparous women.

2) Assessment phase: the researcher started the physical examination of nulliparous women by herself if available or by obstetrician. Examination included cervical dilatation and effacement, membranes condition (ruptured or intact), uterine contractions and its characteristics (frequency, duration, severity), fetal heart rate (FHR), vital signs. Also assess, the severity of pain using short form McGill pain questionnaire and Wong-Baker Faces Pain Rating Scale.

The nulliparous women was told that pain descriptors (First part of (SF-MPQ))

would be read aloud and she should state whether the word described her pain and, if it did, rate the intensity of that, particular quality of the pain from 1 to 3. The intensity of pain was calculated at the time of completing the questionnaire using Visual analogue scale from point zero to the point where the nulliparous women had marked in centimeters. In addition, the nulliparous women asked to mark on the word that best describes the overall intensity of her pain using the present pain intensity. The researcher observed the facial expression that described nulliparous women then marked on suitable face in Wong-Baker Faces Pain Rating Scale.

Then draw 2cm of blood for plasma cortisol level analysis. Specimen collection and preparation takes about 30 minutes. Collect blood specimen through venipuncture using syringe (3cm) and tourniquet, then evacuate sample in tube containing EDTA. The blood specimen centrifuged to separate plasma from the cells for 10 minutes at 5000 rpm. Then Plasma and buffy coat were separated and stored in new tubes after labeled and stored at temperatures of -20◦c for 25 day until more samples collected to analyze at the same time then laboratory specialist performed plasma Cortisol level analysis using Cortisol Elisa kits. Assessment phase consumed about 30 minutes to cover these items for each nulliparous woman.

3) Implementation Phase (pressure on the Sanyinjiao point (sp6)) for the Study group only The researcher stand at the feet of nulliparous woman in labor located the Sanyinjiao point by applying four-finger widths above the tip of the inner malleolus, just posterior to the border of tibia on both legs. Then mark this point using a pen and applied pressure at the Sanyinjiao point (SP6) with pads of the thump on both legs simultaneously (Figure 1). Pressure was applied from the beginning of contraction to its ending then stop pressure and again press with each contraction experienced. Within the beginning of active phase(4cm dilatation) this intervention was applied through 30 minutes . The control group received the routine care of the hospital.

Figure (1): Sanyinjiao Point

4) Evaluation Phase: Immediately after intervention draw another 2cm of blood sent to lab for investigation of plasma Cortisol level. Reassess cervical dilatation and effacement, uterine contractions and its characteristics also the severity of pain using Short Form McGill Pain Questionnaire and Wong-Baker Faces Pain Rating Scale, then go to laboratory for prepare the sample, labeled and stored. Other two assessments were performed after 30 and 60 minutes of intervention.

Statistical analysis:

Statistical Package for Social Science (SPSS), version 20.0 (statistical packages for social science) was used for the statistical analysis of the data that coded and entered into computer. Inferential statistics were used Chi-square to compare between two or more qualitative variables as well as we used T-test to compare between two quantitative variables. Statistical significance was considered at p-value <0.05.

Result

The results of the present study are presented in the following sequence:

- Comparison between interventional and control group regarding Total score of SF-McGill.

- Comparison between interventional and control group regarding Visual analogue scale.

- Comparison between interventional and control group regarding present pain intensity.

- Comparison between interventional and control group regarding Wong Baker Faces Pain scale.

- Comparison between interventional and control group related to plasma cortisol level.

Table (1) shows that when using sensory and affective descriptors of SF-McGill questionnaire to assess pain, the pain for interventional group decreased immediately and after 30 minutes from intervention then increased after 60 minutes, but for control group pain was continuously increased in all assessments; immediately, after 30 and 60 minutes from intervention. No statistical significance differences between groups except for pre-intervention assessment.

As shown in table 2, by using Visual analogue scale for assessing pain, the pain decreased immediately after intervention then increased after 30 and 60 minutes for interventional group but pain increased immediately, after 30 and 60 minutes from intervention for control group. There weren't statistical significance differences between groups.

The result of pain assessment by using present pain intensity scale was shown in table 3 which revealed that pain increased immediately, after 30 and 60 minutes form intervention for both interventional and control group without statistical significance differences.

By using Wong Baker Faces Pain scale, table 4 shows that pain decreased immediately after intervention then increased after 30 and 60 minutes for interventional group, but for control group pain increased immediately, after 30 and 60 minutes from intervention with statistical significance differences between groups.

Table 5 revealed that the mean difference of increased plasma cortisol for interventional group was less than the mean difference for control group with highly statistical significance difference.

Table (1): Comparison between interventional and control group regarding mean score of total score of sensory and affective descriptors of SF-McGill

Total Score of SF-McGill	**Interventional Group (n=30)**	**Control Group (n=30)**	**T-test**	**P value**
	Mean±SD	**Mean±SD**		
Pre- intervention	10.33± 3.781	8.57± 2.473	4.58	0.03 *
Immediately after intervention	10.17± 2.793	9.43± 2.487	1.15	0.28
After 30 min. from intervention	10.07± 2.612	10.53± 2.763	0.45	0.5
After 60 min. from intervention	10.47± 2.909	11.30± 2.493	1.41	0.23

Table (2): Comparison between interventional and control group regarding mean score of Visual analogue scale

Visual Analogue scale	Interventional Group (n=30)	Control Group (n=30)	T-test	P value
	Mean±SD	Mean±SD		
Pre- intervention	3.87±0.629	3.73±0.521	1.00	0.31
Immediately after intervention	3.83± 0.592	3.90± 0.481	2.17	0.14
After 30 min. from intervention	3.97± 0.490	3.90± 0.548	1.10	0.29
After 60 min. from intervention	4.03± 0.490	4.0± 0.455	1.96	0.16

Table (3): Comparison between interventional and control group regarding mean score of present pain intensity scale

present pain intensity scale	Interventional Group (n=30)	Control Group (n=30)	T-test	P value
	Mean±SD	Mean±SD		
Pre- intervention	8.0± 1.930	8.5± 1.925	0.80	0.37
Immediately after intervention	8.30± 1.685	8.93± .639	0.22	0.63
After 30 min. from intervention	8.80± 1.669	9.20±1.243	0.24	0.62
After 60 min. from intervention	9.13± 1.196	9.53±1.008	0.07	0.78

Table (4): Comparison between interventional and control group regarding Wong Baker Faces Pain scale

Wong -Baker Faces Pain scale	Interventional Group (n=30)	Control Group (n=30)	T-test	P value
	Mean±SD	Mean±SD		
Pre- intervention	3.73± 1.112	3.57± 0.728	0.47	0.49
Immediately after intervention	3.40± 0.563	3.83± 0648	7.64	0.008*
After 30 min. from intervention	3.63± 0.615	4.13± 0.681	8.9	0.004*
After 60 min. from intervention	3.83± 0.648	4.23± 0.568	6.46	0.01*

Table (5): Comparison between interventional and control group related to plasma cortisol level

Cortisol level	Interventional Group	Comparison Group	T-test	P value
	Mean ±SD	Mean ±SD		
Cortisol level before intervention				
	195.17±187.177	120.97±173.174	2.540	0.116
Cortisol level after intervention				
	196.80±182.128	131.33±167.336	2.102	0.153
Mean differenc	1.633± 73.719	10.37± 136.0	7.107	0.000**

(**) Highly statistical significance=P value <0.05

Discussion

The present study was conducted to assess the effect of the sanyinjiao point (SP6) acupressure on reducing labor pain intensity. In which research hypothesis "Nulliparous women who receive acupressure on SP6 point would have lower labor pain intensity than who do not "was accepted by the results of this study.

In the current study, the pain was assessed four times: before, immediately, after 30 and 60 minutes from intervention. The main findings after intervention regarding subjective scales revealed that, there were 8 words related to the SF-McGill Pain Questionnaire, frequently used by the participants to describe their pain during labor characterized y sensory aspect as shooting, cramping, aching, gnawing, burning, splitting, heaviness, and tenderness. The words as tiring, exhausting, sickening, fear and punishment were frequently describe the affective aspect of labor pain, in both groups before (except punishment) and immediately, after30 and 60 minutes (except shooting) from the intervention. The total score of SF-McGill pain Questionaire decreased immediately and after30 minutes from the intervention but without statistically significance differences. There were decrease of labor pain regarding mean and standard deviation of visual analogue scale score just immediately after intervention but no significance differences between studied groups. There were gradual increase of labor pain regarding mean of Present pain intensity score immediately, after 30 and 60 minutes without significance differences. Labor pain was less in interventional group than control group when measured by Wong-Baker Faces pain Scale immediately after intervention then increased after 30 and 60 minutes from intervention. The results were statistical significance (p=0.008, p=0.004 and P=0.01 respectively.

These results agreed with **Gallo et al., (2013)** who studied the effect of massage on the severity of pain during labor. They found that, massage can reduce the severity of labor pain, despite not changing its characteristics. He report that, the words used by the participants frequently to describe labor pain were cramping, aching,

and tearing as sensory aspect and tiring exhausting from the affective aspect for both groups without statistical difference between the groups. **Janssen et al., 2012** aim to evaluate the potential effectiveness of massage therapy provided by registered massage therapists in managing labor pain. by using SF-McGill Pain Questionnaire they found that, the total scores on the Short Form McGill Pain Questionnaire were consistently lower in the massage group at all stages of labor, but these differences were not statistically significant.

Chang et al. ;(2006) promote our results when studied the effect of massage on labor pain characteristics using the SF-McGill Pain Questinnaire. They found that, massage cannot change the characteristics of pain experienced by women in labor; it can effectively decrease labor pain intensity. He report that, sore, sharp, heavy, throbbing and cramping were the most frequent sensory characters described labor pain for his participants. While 4 affective descriptors, fearful and tiring-exhausting were the most used to describe the affective dimension.

These results agree with **Shafaie et al., (2013)** who studied the effect of acupressure on Sanyinjiao and Hugo Points on Labor Pain in nulliparous women in different time intervals. They found that there was a statistical significant difference immediately after intervention between both groups related to acupressure groups (P< 0.001). Our study agree also with **Deepak et al.,(2013)** who studied the effect of acupressure on reducing labor pain by applying pressure twice during active phase of labor for 30 minutes during contraction on SP6 point for experimental group. They found that, labor pain reduced significantly among nulliparous women immediately after intervention ($p < 0.001$) for experimental group.

Lee et al., (2004) support us by examining the effects of SP6 acupressure on labor pain and duration of labor They found that, there was significant differences between the groups in subjective labor pain score immediately, after 30 and 60 minutes from intervention (p=0.012,P=0.021, p=0.012). Moreover, study of **Abd-El Fadeel et al., (2013)** aimed to examine the effect of acupressure on labor pain and duration of delivery among laboring women attending Cairo university hospital, they found that, SP6 acupressure was effective in reducing labor pain with a statistical significant differences between groups in subjective labor pain scores immediately, after30 and 60 minutes from the intervention.

Also, our study results confirmed by **Akbarzadeh et al., (2013)** who conducted a study In Iran, Shiraz University hospitals of medical sciences aimed to compare the Effect of Acupressure at two GB-21 and Sp6 point on the severity of labor pain and the delivery outcome. They found that, highest reduction rate was related to immediately after intervention in the interventional groups (P=0.001) than after 30 and 60 minutes (p=0.001) but the two groups of intervention hadn't statistical differences (P=0.93).

Other study by **Hjelmstedt et al., (2010)** agreed with our result when studied the effect of acupressure on pain levels during the active phase of labor with nulliparous women. Three groups were assigned; acupressure, touch and standard care groups. They noticed that a reduction of pain was highest rate immediately after intervention with VAS with statistical significance differences (P=0.001) than after 30and 60 minutes (p=0.001and p=0.01). **Kashanian &Shahali, (2009)** studied the effect of acupressure at the Sanyinjiao point (SP6) on the process of active phase of labor in nulliparas women and notify that labor pain were less in the SP6 acupressure group than control group(P=0.003) .

In addition, **Salehian et al., (2011)** studied the effect of San-Yin-Jiao (SP6) acupressure on labor pain and the length of delivery time in nulliparous women. They report that; acupressure affects on the intensity of labor pain with statistical significant difference between two groups of interventional and control group ($p<0.001$). Moreover, study of **Hamidzadeh et al., (2012)** agreed with our findings by studying the effects of LI4 acupressure on labor pain in the first stage of labor. They found that, more satisfaction was reported by participants in the acupressure group who had decreased pain. There were decreased of labor pain in interventional group than control with significant differences between the groups in subjective labor pain scores ($P \leq 0.001$).

Hajiamini et al., (2012) agree with our results when studied the effect of L14 acupressure and ice massage on labor pain reduction. Two interventional groups and control group. VAS was used to assess level of pain before, immediately, after 30and 60 minutes from intervention. They found immediately that, a decrease of labor pain in intrventional group compared to control group with statistical significance differences ($P<0.001$). Our study results were confirmed by **Samadi et al.,(2010)** who reported that, the average amounts of the consumed analgesia among the study groups (sp6 group, touch group and routine care group) was significantly decrease in the group who received pressure on SP6 more than the other two control groups ($p=0.006$) .

Other studies by **Chung et al., (2003)** evaluate the effects of LI4 and BL 67 acupressure on labor pain and uterine contractions in the first stage of labor. An experimental study with a pretest and posttest control group design which assigned to three groups. Each group received only one of the following treatments, LI4 and BL67 acupressure, light skin stroking, or no treatment/conversation only. Findings indicated that decreased level of pain with acupressure groups with a significant difference during the active phase of the first stage of labor among the three groups.

In our study, we prefer to measure women's plasma cortisol level as an objective method to evaluate the change in level of pain. We found that, there was a significant controlling in labor pain for interventional group related to plasma cortisol levels ($P=0.000$). Plasma cortisol increase by physical and emotional stress, as well as illness, because during the normal stress response the pituitary gland releases more adrenocorticotropic hormone ACTH **(Stewart; 2011)**. Only **Hosseini et al.**, **(2013)** examine the effects of massage therapy on labor progress and plasma levels of cortisol in the active stage of first labor. They found that, massage therapy was significantly increasing the level of cortisol hormone in experimental and control group; however, this increase was significantly lower in experimental group ($P\leq0.001$) than control group ($P\leq0.0005$). So, he confirms our results.

It is viewed that some of the subjective labor pain scales used in this study usually showed increase in women's pain intensity but without significance and other showed decrease of labor pain. On other hand, objective labor pain scales as plasma cortisol level proved significant difference in reducing labor pain in acupressure group comparing to control group ($p\leq0.05$). In this matter **Shafaie et al., (2013)** stated that subjective labor pain scales, that is self-assessment of pain, may be vary based on different people and can't limited accurately by the researcher.

From the researcher point of view, the difference can be related to our cultures that tend to be more expressive and emotional, which can be seen in a Mediterranean women areas (including

Egyptian women) who giving birth with clear and expressive communication of how she is feeling **(Akinc,2013)**. So, we can prove that SP6 acupressure was effective for reducing labor pain in nulliparous women during labor. SP6 acupressure can be an effective nursing management for women in labor.

Conclusion

Based on the findings the study concluded that, SP6 acupressure was effective to decrease labor pain for nulliparous women during active phase of labor.In the light of the findings of the current study the researcher recommends:In-services nursing training program are needed about applying acupressure on sanyinjiao point (sp6) at labor ward as a part of nursing care to reduce labor pain. Further researches using large sample size are needed and other evaluating scales are proposed. and Further researches to test the effect of other sanyinjiao point to reduce labor pain are recommended.

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