Original Article

The Effect of Reflexology on Labor Pain and Length Among Primiparous Women: A Randomized Controlled Trial

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Abstract

Background: Pain control is considered as the key issue in modern midwifery. Along with medical painkillers, reflexology is viewed as a non-medical and noninvasive method. Hence, we aimed to investigate the effect of reflexology on the intensity of pain and length of labor. **Materials and Methods:** In this clinical trial, participants included 240 Iranian primiparous women with term and singleton pregnancy. Having a 3-4 cm cervical dilatation once they visited the hospital. Through a convenient sampling method, they were selected and then randomly divided into two groups. In the intervention group, reflexology was performed, and the intensity of pain during the active phase of labor along with the length of labor in the active phase was measured by visual analog scale (VAS) and compared with the control group. Data were analyzed using descriptive statistics, t-test, and Mann-Whitney U-test. **Result:** Data analysis showed a statistically significant difference between the intensity of pain in the 5-7 and 8-10 cm dilatation in the two groups (P=0.01). Moreover, the labor length in the active phase was found to be significantly shorter in the intervention group (P<0.001). **Conclusion:** It appears that reflexology can lead to a reduction in the pain and length of labor. Therefore, through instructing this technique, a goal of midwifery, which is reducing labor pain and its length can be achieved.

Keywords: Reflexology, Labor Pain, Labor Length, Primiparous Women

Introduction

A myriad of questions has always existed concerning the delivery process. Among them are which factors can minimize delivery discomforts and which treatments or techniques can reduce the intensity of pain or the time length of the delivery process. All methods should be in line with providing the safety and health of the fetus as well as the mother's comfort (1). Labor pain is one of the most severe pains that human beings have ever experienced. It has undesirable effects on the delivery process since it could add to the mother's fear or stress during the delivery and stimulate sympathetic nerves, which leads to an increase in catecholamines such as epinephrine and norepinephrine. The result would be more intense pain and a lengthier first phase of the labor. All together, they cause more dissatisfaction with the delivery experience

(2). The over-intensive pain would leave undesirable effects on the mother and the baby. Among them are disorders in a fetal heartbeat, low uterine blood flow, lowering of Apgar scoring, gastroparesis, contractions of pelvic floor muscles, blood loss and impairment in the delivery process, fetal presentation, fetal descent, lengthening of the delivery process, and increasing the probability of aided and/or surgical labor (3). On the other hand, fear of natural delivery has caused people to appeal to cesarean that is on the rise these days in our country (4). However, the World Health Organization has announced this rate to be 5-15%. However, studies show that 71% of mothers frightened by the pain of natural delivery, choose to have cesarean (5). The mortality rate of cesarean delivery is 2-3 times more than the natural delivery, and its disability rate is also 5-10 times as high (2). Methods of relieving childbirth pain are mainly divided into two types; medical

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and non-medical. The three pain-killing principles in midwifery are simplicity, safety, and maintaining fetal hemostasis (3). The privilege of using non-medical methods is causing no interference in the delivery process and has no side effects on both mother and her baby. One of such non-medical methods is reflexology or reflexology therapy that is a noninvasive technique. It is based on the idea that reflexive spots are located on the foot and palm corresponding to each part of body, muscle, bone or gland (6). As a complementary therapy, reflexology has been used from ancient era until now and involves massaging particular spots on the feet or palms affecting different parts of the body. It is used to treat many diseases such as migraine headaches, breathing difficulties, vascular disorders, pain, stress, anxiety, high blood pressure, insomnia, etc. (7, 8). During pregnancy, delivery and even after that, it is also used to treat some physiological conditions including nausea, vomiting, constipation, headache, backache, pain reduction during delivery, retained placenta, reduction of urinary retention, and helping breastfeeding (1, 8, 9). It also helps one's mental relaxation during labor and, therefore, it helps to better control pain (10). Reflexology functioning is still unclear, but some theories have tried to explain it. Among the probable causes or explanatory theories are gate control theory of pain, neural impulse theory, an increase in the production of endorphin and encephalins to control pain, an improvement of lymphatic flow along with a strengthening of the immune system, an improvement of blood flow and elimination of body toxin,s which helps to improve blood flow (11,12). Considering the diverse applications of this technique and the fact that pain reduction is a modern midwifery healthcare goal and also mothers' preference for cesarean because of fearing natural delivery pain, the present research intended to investigate the effect of reflexology on the intensity of pain and length of labor.

Materials and Methods

Based on Dolatian et.al study, in this randomized clinical trial, $\alpha = 0.05$, $\beta = 0.2$ and d was 0.5. This study was approved by the Ethics of Hormozgan University of Medical Science (HUMS), Iran. Two hundred forty primiparous mothers who had visited at Shariati hospital of Bandar Abbas in 2014 and met all the inclusion criteria participated in this study. These criteria were 18 to 35 years, Iranian nationality, being in their 37th to 42nd week of pregnancy, their fetal head being presented, having no history of infertility and caesarian indications, their pregnancy being intended, having no medical or delivery problem attested by gynecologists, applying no other anesthetic or painkilling method during delivery, and having a 3-4-cm cervical dilatation. They were selected through the convenient sampling

method and were randomly divided into two groups. The even numbers went to the control group (120 members), and the odd numbers were assigned to the intervention group (120 members). The process of the participant's allocation is shown in Figure-1. This study is a single-blinded method in a way that the subject were not aware of the techniques used. The treatment process was explained to all participants, and they entered the research with full consent. The instruments employed in this study were the personal information form, the vaginal examination checklist as well as the visual analog scale (VAS). To validate the first two, content validation was done. Their reliability was also determined through the estimation of the alpha coefficient. VAS was already validated and used prevalently in different studies. According to Wall and Melzack, this questionnaire is highly valid (13). Concurrent validation was done to make sure of the correct reflexive spots and how the massage was performed by consulting expert acupuncturists. Reflexology was carried out by an assistant researcher who was unaware of the effect of reflexology on reducing labor pain. In the intervention group, once the 4-cm dilatation was beginning, a mild massage was done on the whole surface of the foot. It was followed by a massage of the reflexive spot for pain reduction, which is a curving area between the ankle and the heel that is called the uterine area. It received a 10-min massage in each foot (totally 20 mins). Once contractions began, the massage would also begin, and once the contractions were over, the message was over too. The frequency of massage depended on the frequency of contractions during 20 minutes. In the control group, a similar process was followed; however, a spot other than the uterine spot was massaged. The intensity of pain the participants experienced was measured via the VAS diagram. This diagram is a ruler-like instrument numbered from 0 to 10. Zero is indicative of no pain and 10 indicates the most intense pain. This instrument was shown and introduced to the mother before the whole process began and she knew how to express and record her pain. The two other forms, including the personal information, and the observation and examination checklists (the record of pain intensity and the length of labor in the active phase), were also filled out. The intensity of pain in the active labor phase (the 3-4, 5-7, and 8-10 cm dilatations) along with the length of labor in the active phase (in the 1st labor phase from the dilatation time of 4-10 cm) were measured and compared between the two groups. By research-based questioner, data gathering was performed. Validity and reliability of questioner were evaluated. Cronbach alpha was set at 0.08 while the significance level was 0.05. In this study, statistical analyses were done via SPSS software version 18. T-test and Mann-Whitney U-test were also employed.

Result

The findings indicated that the average age of the participants was 25.45±5.23 years. The educational level of the majority of the participants in the two groups was high school, and they were mostly housewives. The economic status of them was in moderate level (Table-1). Figure-1 is indicative of the intensity of pain in the two groups (control and intervention). In the intervention group, the mean intensity of pain in the 3-4, 5-7 and 8-10 cm dilatations was lower than the control. According to Mann-Whitney U-test, a statistically significant difference was found between the intensity of pain in the 5-7 and 8-10 cm dilatations of the two groups (P=0.01). Moreover, the length of labor in the active phase (from the 4-10 cm dilatation) was found to be shorter in the reflexology group which was statistically significant (P<0.001, Table-2).

Discussion

Relieving labor pain is considered as one of the main obsessions of modern midwifery. Recently, reflexolo-gy has become particularly important due to medical and supplementary medical advances (1). They have encouraged the consumption of labor painkillers (1,6). The findings of present research indicated a reduction in the mean intensity of labor's pain in the intervention group compared to the control. In a study investigating the effect of reflexology on pain tolerance and pain threshold among volunteers prone to severe pain, Samuel et al. witnessed a positive effect of this technique on lowering pain threshold and increasing mothers' tolerance (14). In the present research, reflexology was found to effectively reduce pain in all active phases of labor, particularly in the 5-7 and 8-10 cm dilatations. This was in line with the findings of Mirzaee et al. and Dowlatian et al. (10, 15). In Mei et al. (16) study, two groups were selected randomly. In the intervention group, participants received 30 minutes of massage in each stage of the latent and active phases of labor. The control group received only routine healthcare services. They indicated that although a massage does not modify labor experiences, it highly reduces the intensity of pain in the latent and active phases of labor (3-4 and 5-7 cm dilatations). However, it does not reduce pain in the 8-10

Table 1: Compare the characteristics of participants in intervention and control groups

Variable		Intervention group (n=120)	Control group (n=120)	P-value
Age(years)[a]		24.37±4.59	25.24±5.23	0.092*
Gestational age(week)[a]		39.03±0.93	38.81±0.99	0.083*
Education level[b]	Guidance school or less	77(64.2)	86(71.7)	0.372**
	Complete high school	32(26.7)	28(23.3)	
	college	11(9.2)	6(5)	
Job status[b]	Employment	9(7.5)	4(3.3)	0.154**
	Housewife	111(92.5)	116(96.7)	

a Mean±SD ; b n(%)   * T-test   **Mann-Whitney U-test

Table 2. Comparing the labor length of the active phase in the control and intervention groups

Group	N	Length of labor (min) Mean±SD	P-value
Intervention	120	224.90 ± 35.7	<0.001
Control	120	268.42± 53.3	

dilatation (16). McNeill et al. (17) study was carried out aiming to explore the correlation between reflexology and pregnancy consequences. In the group which had received reflexology, the intensity of pain and the need for entonox was reduced. Fifty-four percent of the intervention group had received entonox compared to 74.5% of the control group (17). Smith et al. also investigated the effects of reflexology and other non-medical techniques of controlling labor. Compared to the other non-medical techniques, reflexology managed to reduce the intensity of labor pain with a confidence factor of 95% (18). In Davim et al. study, the focus was also on non-medical and noninvasive labor pain controlling techniques including reflexology. Eighty-one percent of the women received oxytocin, and 15% received no medication during their labor. In women who had made use of noninvasive techniques, the intensity of pain was reduced when the labor was in progress and dilatations were increasing (19). In Hall et al. study, non-medical techniques such as relaxation, reflexology, and acupressure were employed to reduce the intensity of labor pain. These techniques were found to be effective in reducing pain and should be attended to by midwives and healthcare providers (20). In the present research, the time length of labor in the active phase (4 dilatations of 4-10 cm) was also found to be shorter in the intervention group. Mackey also indicated that the use of reflexology could help to reduce the labor length in the first and second phases of delivery for 3 hours (21). A similar finding was reported by McNeill et al. who found that reflexology could cut down on the labor length for 40 minutes (17). There is not adequate information by reflexology (4). However, this technique can make the delivery process desirable for mothers (22). According to research, reflexology reduces the intensity of pain during labor through causing physiological transformations and releasing endorphins which can, in turn, cause relaxation and less pain in the mother (23). In their book called 'The traditional and modern medical techniques,' Novin & Soleimaniye state "reflexology eliminates obstructions and releases the flow of energy in channels." These channels are closely related to the neural pathways of the feet. A massage can help to stimulate these links (23). According to another theory, there exist over 72,000 neural terminals in each foot, which are closely related to the central neural system. These neural terminals are part of the sensory system, which feels pain, pressure, chill, and heat. Reflexology stimulates and regulates this sensory system and the neural pathways (7, 8, 23). A body of research has also indicated pain during labor is reduced by stimulating reflex zone for uterus,the pituitary gland and other pelvic organs (6).

Conclusion

According to the findings of this research, reflexology is a simple technique which can be used to decrease the high prevalence of caesarian, which is mostly preferred because of the fear of natural delivery pain. It can help to reduce the intensity of labor pain and make the delivery a desirable experience for mothers.

Acknowledgment

Conflict of Interest

There is no conflict of interest to be declared.

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