



Effect of foot reflexology on pain and outcomes of labor

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Abstract

Back ground: Labor is a process that permits a series of extensive physiologic changes in the mother to allow for the delivery through the birth canal. **Purpose:** This study was conducted to determine the effect of foot reflexology on pain and outcomes of labor. **Subjects:** Forty primigravida women diagnosed in labor clinically by Gynecologist as primigravida. They were selected from obstetrics department in El Sahel Teaching Hospital, their age ranged from 20 to 35 years and their gestational age ranged from 37 to 41 weeks. They were divided into 2 equal groups (A&B). **Methods:** Group (A): received foot reflexology during labor for 20 minutes for each foot when cervix is at 3 to 5 cm dilatation in addition to the routine health care as well as verbal and emotional support. Group (B) received routine health care as well as verbal and emotional support when cervix was at 3 to 5 cm dilatation. **Main measures:** Pain was evaluated by Visual Analogue Scale while outcomes of labor were evaluated by Apgar score to evaluate new born physical condition. **Results:** There was statistical significant increase in the mean value of Apgar score measured after 1 minute and after 5 minutes of labor in group (A) when compared with its corresponding value in group (B). There was a statistically highly significant decrease in pain, after receiving reflexology in addition to the routine health care in group (A) compared with the degree of pain in group (B) who received routine health care only. **Conclusion:** It could be concluded that the reflexology was very effective method in relieving labor pain and improving outcomes of labor.

Key words: Reflexology-Labor pain – Outcomes of labor - Apgar score.

INTRODUCTION

Pain is a subjective experience influenced by physiological, psychological, cultural, and environmental factors. Labor pain is one of the most severe pains that

women experience during their life and can affect mothers and other family members' life in all aspects. Labor pain causes confusion and impaired mental health in women and damages their relationship with their husbands and other relatives. Also, this pain can be a cause of anxiety and fear for the next pregnancy (1). Comfort is expressed as a critical and vital need in nursing and it has a multidimensional concept with multiple literal meanings. Comfort is a complex concept with unclear, holistic valuable, and necessary terms in health care. It is a major issue in nursing interventions and patient care outcomes (2). One of the common factors is the fear and anxiety because of lack of information or having wrong information about labor. In addition, elimination of fear and anxiety not only causes satisfactory labor but also increases motivation to create a good mother and child relationship. Severe labor pain can lead to long-term psychological disturbance, disturb the mental health of the mother and affect the mother infant relationship negatively. For this reason, effective control of labor pain like other acute pains is the most important social and health challenge. Labor pains alleviation should be somehow such that consciousness of the mother is not disturbed and the mother can help, without fetal side effects or any disturbance in labor process or in umbilical uterine blood flow (3).

Labor can be considered as one of the human's physiological behaviors; which its creation cycle has remained unchanged from the beginning of the human creation. Labor pain management can be done in two methods: pharmacological and non-pharmacological methods (4). The non-pharmacological methods including massage, reflexology, touch therapy, relaxation, dancing, heat and cold therapy (e.g. taking a shower or hot bath), transesubcutaneous electrical nerve stimulation, water therapy, acupuncture, aromatherapy and music therapy. Some believed these techniques had been very effective on pain relief. The pharmacological methods of pain relieving including receiving narcotics drugs such as Pethidine, using Entonox gas and the types of topical anesthetics such as pudendal nerve block, paracervical block, spinal block and epidural analgesia (5).

In the pharmacological methods, the pain feeling would be reduced physiologically but psychological and emotional conditions of the mothers are ignored (6).

Reflexology as one of the branches of the complementary medicine is a gentle art and an individual healing form and type of a prospective comprehensive treatment which believes the individual and the disease cannot be divided into separate treatable parts, but she should be considered and treated as a whole person which consists of body, mind, emotions, spirit and feelings which each of them are influencing and contrasting the other. In fact, reflexology affects the physiological and psychological stimulation points (7). Reflexology in the pregnancy period, labor and postpartum period can be usable for treating many physiological conditions such as nausea, pregnancy vomiting, constipation, headache and low back pain even in the breastfeeding period (8).

In the reflexology, with massage and skin contrast, enkephalins and endorphins are secreted and can reduce the anxiety and pain. This technique can bring about the sense of well being and healthy. In addition, analgesia may be established by pressure on the specific reflex points. Generally, reflexology techniques would stop the neural transmission of the pain message to the brain and subsequently the perception of pain relief through control gate (9).

Doctors are keen to incorporate such therapies as they consider them safe, compatible with the patient centred approach and the natural nature of pregnancy and

childbirth and that complementary and alternative medicine(CAM) “can enhance their own professional autonomy” (10). Likewise, women use CAM therapies during pregnancy as they also consider them safe, natural (11) and offer them control over their pregnancy and labor (12) and as a method of pain relief (13). In fact many investigations into the use of reflexology during pregnancy have been carried out in the intranatal period during uncomplicated labor for pain relief (14).

SUBJECTS AND METHODS

Subjects: Fortyprimigravida women in labor diagnosed clinically by gynecologist and were anticipated to deliver normally. and they were selected from obstetrics department in Elshahel Teaching hospital and their age ranged from 20 to 35 years and their gestational age ranged from 37 to 41 weeks. The Subjects were excluded for the following criteria: Multiparous women, twins, Infectious disease and fever, psychological disorders, epilepsy or seizures, Poly-hydramnios or oligohydramnios, history of any problem during this labor (placenta previa, abortion risk), Fetal distress, Hemorrhage , Incidence of any non-diagnosed dystocia., Women had thrombotic disease of lower extremities, as well as foot ulcers. All subjects signed a consent form before participation in this study.

They were divided randomly into 2 equal groups (A&B). Group (A) received foot reflexology intervention during labor for 20 minutes for each foot when cervix is at 3-5 cm dilatation in addition to routine health care. Group(B) received routine healthcare. Routine healthcare was done as the following recording of fetal heart rate and uterine contractions every 15 minutes and recording vital signs when cervix was at 3 to 5 cm dilatation. Pain was evaluated by Visual Analogue Scale while outcomes of labor were evaluated by Apgar score to evaluate new born physical condition in both groups (A&B).

Evaluative Methods

- 1- **Height and weight scale:** A universal height and weight scale will be used to determine the subjects height and weight in order to calculate body mass index (BMI) for all participants in the two groups in a Recording data sheet.
- 2- **Visual Analogue Scale:** was used to measure intensity of labor pain(19).
- 3- **Apgar score:** Apgar score in 1-5 minutes after the labor used to evaluate the appearance , pulse, grimace, activity, and respiration of the baby (5).

Treatment procedures:

Reflexology Therapy:

In group (A), all participants received foot reflexology intervention during labor for 20 minutes for each foot when cervix was at 3-5 cm dilatation. First the foot was inspected for any cuts or broken skin or ulcers then cleaned with alcohol, intervention in reflexology group was performed by mild effleurage massage of all foot sole for 3 times ,effleurage the leg for 3 times, circular effleurage at the sides of the foot for 3 times then foot sides was rubbed for 3 times, circular motion was performed around medial and lateral malleoli for 3 times, rotate the toes 3 times clockwise and 3 times anti clock wise (by relaxation techniques that loosened the foot and prepared it to do specific reflexology techniques), then reflexology began by walking techniques all over the five zones of the foot and then fixed and rotating pressure was applied on zone of pituitary gland that is located in the center of the big toe, Solar plexus, lumbar and sacral spine and genital points and also ovaries , uterine,

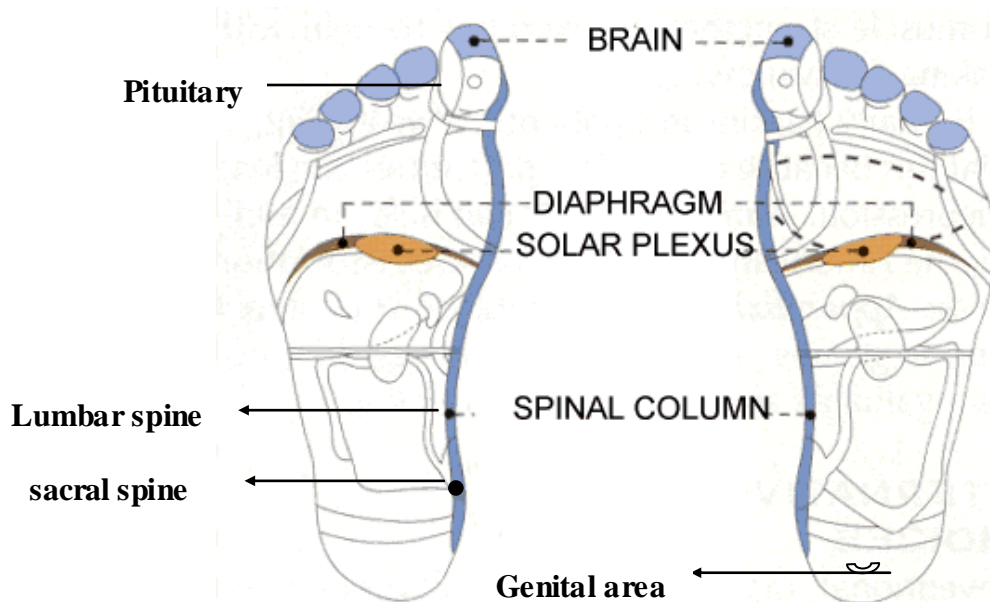
pelvic region, fallopian tubes and sciatica points walking all over the spine and then effleurage massage were performed again for 40 minutes (20 minutes for each foot) (15).

The sole of the foot divided into three parts, solar plexus in the border of upper and middle one-third of sole (where foot wrinkle is created when the sole bends) is located in the second and third toes. The pituitary gland is located in the center of the big toe, and genital area is located in the indented region between the inner ankle and sole.

For the reflexology session, thumb and index fingers were used to work on the feet. First mild effleurage massage was given on all feet as preparation and warming up and then pressure was applied on concerned and specified points as follows (16):

- 1) Pituitary gland, in the centre of the big toe.
- 2) Solar plexus, almost four fingers width below the base of the toes of the feet, located in the center (middle of diaphragm).
- 3) Lumbar and sacral spine (spinal cord region).
- 4) Genital area, below the ankle,
- 5) fallopian tubes: line between 2 malleoli.
- 6) Uterus: lateral to lateral malleolus.
- 7) Sciatic nerve: at the medial and lateral sides of the heel.
- 8) Pelvic area: at the base of the heel, (fig.1)

Fig (1): Feet areas for reflexology (16).



Treatment procedures for all participants in group (A&B):

Women in both groups received the same routine health care as well as spiritual, emotional and verbal support started at the 3-5 cm dilation stage and ended at the active phase of the labor.

Statistical analysis

- 1 Results are expressed as mean \pm standard deviation. Comparison between variables in the two groups was performed using unpaired t test. Comparison

between variables measured before and after intervention in the same group was performed using paired t test.

- 2 Statistical Package for Social Sciences (SPSS) computer program (version 19 windows) was used for data analysis. P value ≤ 0.05 was considered significant.

RESULTS:

The subject's age, weight, height and BMI were recorded. There was no significant difference in demographic data between both groups (**Tab. 1**). The obtained results of this study showed statistical significant increase in the mean value of Apgar scores measured after 1 minute and after 5 minutes of labor in group(A) when compared with its corresponding value in group (B) with p value =0.001. There was a statistically highly significant decrease in pain (with p value = 0.001), after receiving reflexology session compared with the degree of pain before reflexology session (within group(A)) also there was a statistically highly significant decrease in pain (with p value = 0.001) in group (A) who treated with reflexology compared with the degree of pain in group(B) who received verbal and emotional support only, between groups (A, B) .In group (B): the percentage increase in pain was 13.69% while in group (A) the percentage decrease in pain was 28.38%.

Table (1): Demographic features of the two studied groups(A&B)

variables	Group(A)(n=20)	Group(B)(n=20)	t value	Level of significance
Age (yrs.)	23.1 ± 2.94	23.05 ± 3.63	-0.048	P <0.962 (NS)
Gestational age (wks.)	39.0 ± 0.92	38.6 ± 0.94	-1.361	P <0.181 (NS)
Weight (kg.)	79.9 ± 13.81	82.95 ± 8.15	0.851	P <0.402 (NS)
Height (m.)	1.63 ± 0.06	1.64 ± 0.05	0.405	P <0.687 (NS)
BMI(kg/m ²)	29.82 ± 3.92	30.91 ± 3.33	0.954	P < 0.346 (NS)

Table (2): Comparison between mean values of Apgar scores in both groups (A&B).

Apgar scores	Group(A)(n=20)	Group(B)(n=20)	t value	Level of significance
Apgar(1 min.)	8.65 ± 0.75	7.6 ± 0.68	-4.653	P <0.001*
Apgar(5 min.)	9.8 ± 0.41	9.15 ± 0.37	-5.284	P <0.001*

Table (3): Between groups comparison and within group comparison between mean values of VAS measured before and after intervention in both groups (A & B).

VAS scores	Group(A)(n=20)	Group(B)(n=20)	t value	Level of significance
Before	8.85 ± 0.93	8.40 ± 0.75	-1.677	P <0.102 (NS)
After	6.25 ± 1.77	9.55 ± 0.61	7.877	P <0.001*
Mean difference	2.60	-1.15		
% change	28.38 ↓↓	13.69 ↑↑		
t value	7.935	-8.759		
p value	0.001*	0.001*		

DISCUSSION: The results of this study revealed that there was statistical significant increase in the mean value of apgar score measured after 1 minute and after 5 minutes of labor in group(A) when compared with its corresponding value in group(B). There was a statistically highly significant decrease in pain after receiving reflexology session compared with the degree of pain before reflexology session (within group(A)) also there was a statistically highly significant decrease in pain in group (A) who treated with reflexology compared with the degree of pain in group(B) who received verbal and emotional support only between groups (A, B)

The result of this study agreed with those of **Soheila, et al** who examined the effect of foot reflexology on anxiety, pain, and outcomes of the labor in Primigravida Women and found that The mean of anxiety score in the first stage of labor before intervention was not significant in both groups but after intervention, the mean anxiety score in intervention group was significantly decreased in comparison with the control group. There was statistically significant difference with respect to mean pain intensity in half, one and two hours after Intervention for both groups, there was a statistically significant difference between the mean of the duration of labor in both groups. According to type of labor 92.5% in intervention group and 80% in the control group had natural vaginal delivery. Apgar score in the first minute and fifth minute was significantly increased in the reflexology group(A) in comparison with the group(B) (17).

The results of current study are supported by **Valiani, et al** who reviewed the effect of reflexology on the pain and certain features and outcomes of the labor on the primiparous women and stated that There was no significant difference between groups before intervention. In the reflexology group, there was a significant difference between the pain rating index (PRI) before and after the 4 stages intervention. PRI was different significantly between studied groups after intervention. The length of active phase of labor was different significantly between the two groups the difference between the 1st minute and the 5th minute Apgar score

and rate of hemorrhage between the two groups were different significantly. So it was stated that Reflexology can lead to decrease in the labor pain. Therefore, regarding to the safety of this technique, it can be replaced as an alternative for pharmacological methods (5).

The results of this study agreed with those of **Eghbali, et al** who studied the effect of reflexology on chronic low back pain intensity comparing the average pain scores before and after the intervention in the study groups revealed a significant reduction in pain scores in both test and control groups. In addition, comparing the average pain scores after the intervention in the control and test groups showed a significantly higher score reduction in the test group than the control group and comparing mean changes of pain scores before and after the intervention in the test and control groups indicated the change in the test group to be significantly higher than the control group (18).

The result of this study agreed with **Mirzai, et al** that reviewed the effect of reflexology on the primiparous women found no statistical significant difference in relation to systolic and diastolic blood pressure of the mothers in the case and control groups. Severity of labor pain in the intervention group was lower than the control group ($p < 0.001$). The severity of labor pain reduced after the intervention in the intervention group ($p < 0.001$), whereas, labor pain increased in the control group ($p < 0.001$). but disagreed with this study in that the labor durations were same in both groups ($p < 0.063$). It was stated that reflexology have an effect on decreasing labor pain in the first phase, whereas, it does not affect the total duration of labor (19).

The results of this study are supported by **Dolatian, et al** who examined The effect of reflexology on pain intensity and duration of labor on primiparas. Pain intensity at all the three stages of cervical dilatation was significantly lower in the reflexology group. During the 4-5 cm dilatation stage, women in the supported group reported less severe pain compared to those receiving routine care, but no significant differences at the later stages of labor. This indicates that reflexology could decrease the duration of first, second and third stages of labor and showed that reflexology increased both pain threshold and tolerance in human volunteers exposed to acute pain. These findings indicated the possibility of using reflexology in the management of pain (15).

On the other hand, the results of this study disagreed with those of **McNeill, et al** who studied A retrospective cohort study exploring the relationship between antenatal reflexology and intranatal outcomes they reported that, Onset of labor was the primary outcome of interest and there was no difference found between groups for this variable. Mode of delivery There were 15% fewer normal deliveries in the reflexology group with women experiencing more forceps deliveries and vacuum extractions than the comparison group. Analgesia 27 of the reflexology group used EntonoxTM in comparison to 73 in the low-risk comparison group. Duration of labor the mean duration of labor was very similar between the two groups demonstrating no significant difference, Within-group analysis showed that mean duration of labor was found to be shorter for those women who had four or more reflexology treatments. Apgar scores at both 1 and 5 min for both groups were not significant. The mean score at 1 min for the reflexology group was 8.28 and 8 for the control group at 5 min the scores were also similar: 9.08 for group 1 and 8.93 for group 2 (8).

Conclusion The findings of this study have concluded that the reflexology was very effective method in relieving labor pain and improving outcomes of labor.

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الملخص العربي

تأثير الريفلكسولوجي للقدمين على آلام الولادة ونتائجها

اجريت هذه الرسالة لتحديد تأثير الريفلكسولوجي على الام الولادة ونتائجها حيث تم اختيار اربعين امرأة حامل تم تشخيصها من قبل طبيب امراض النساء والتوليد على انها بكرية الحمل ، وتم اختيارهن بشكل عشوائي من قسم النساء والتوليد بمستشفى الساحل التعليمي ، وتراوحت اعمارهم ما بين 20 - 35 سنة ، ومؤشر كتلة الجسم اقل من 30 كم ام 2 ، وعمر الجنين تراوح بين 37 - 41 اسبوع ثم تم تقسيمهن عشوائيا الي مجموعتين متساويتين (أ وب) حيث تلقت مجموعه (أ) 20 دقيقة من الريفلكسولوجي لكل قدم اثناء المرحلة الاولى من الولادة عندما كان عنق الرحم مفتوحا من 3 - 5 سم . تلقت المجموعه (ب) الرعاية الصحية الروتينية عندما كان عنق الرحم مفتوح من 3 - 5 سم وتم تقييم الالم بواسطة مقياس الالم البصر بينما تم تقييم نتائج الحمل من خلال النتيجة ايجار لتقييم الحالة البدنية للطفل حديث الولادة .

وقد اظهرت النتائج المتحصل عليها من هذه الرسالة زيادة ذات دلالة احصائية في متوسط قيمة النتيجة ايجار عندما تم قياسها بعد دقيقة وبعد خمس دقائق في مجموعه (أ) مقارنة مع القيمة المقابلة لها في المجموعه (ب)، كان هناك انخفاض احصائيا مهما للغاية في الالم بعد تلقي جلسة الريفلكسولوجي ضمن المجموعه (أ) كما كان هناك انخفاض احصائيا مهما للغاية في الالم في مجموعه الدراسة (أ) التي تلقت الريفلكسولوجي بالمقارنة مع درجه الالم في المجموعه (ب) الذين تلقوا الدعم النفسي واللفظي فقط بين مجموعه (أ وب) . لذلك يمكن ان نستنتج ان الريفلكسولوجي للقدمين كان طريقة فعالة جدا لتخفيف حدة الام الولادة وتحسين نتائجها .

الكلمات الدالة: الريفلكسولوجي-الام الولادة - نتائج الولادة - النتيجة ايجار