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Effects of Foot Reflexology on Post-Cesarean Pain: A Randomized Clinical Trial

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Abstract

Introduction: Post-cesarean pain should be specially managed in order to prevent unwanted complications. Hence, the present study aimed to investigate the effect of foot reflexology on post-cesarean pain. Methodology: The present randomized clinical trial was conducted on 60 women in Al-Zahra Hospital of Tabriz. According to a similar study, participants were selected using convenience sampling. The participants were assigned to the massage therapy group (n=30) and control group (n=30) based on random allocation. Those in the massage therapy group received massaging of both feet for 10 minutes 6 hours after cesarean section. The data were statistically analyzed using the independent t-test, the Mann–Whitney U test, chi-square test, Fisher's exact test, and the paired sample t-test at the significance level of 0.05. Results: The results of the independent t-test indicated that the mean severity of pain significantly reduced in the massage therapy group on all three days studied after the intervention ($p \leq 0.003$). Conclusion: The findings suggested that short-term foot reflexology reduced post-cesarean pain. Since foot reflexology is a simple method, it is recommended to be included in health care programs.

Key words: Cesarean, Foot Reflexology, Pain Reduction.

Introduction

Reflexology is a complementary medicine technique that is used to treat some diseases such as migraine and to relieve postoperative pains (Tsay et al., 2008). It is assumed that reflexology stimulates the pituitary gland and the hypothalamus and relieves pain by increasing the secretion of endorphins (a morphine-like endogenous opioid) (Dougans, 1996).

As one of the most common surgeries among women, the frequency of cesarean sections is increasing in Iranian society with a prevalence of 50% in public hospitals (Ahmad Nia et al., 2009). Post-cesarean pain management is highly important and vital because of the increased risk of thromboembolic diseases following the pain-induced inactivity during the postpartum period (Gadsden, Hart and Santos, 2005). Hence, it is necessary to effectively and safely relieve post-cesarean pain in a way that does not disturb the mother's ability to care for her infant and causes no complication to the infant (Bagheri, Ghiasi and Ahmadnia, 2018). Different techniques have been proposed to reduce childbirth pains. Reflexology is one of the methods that can effectively reduce post-cesarean (Degirmen et al., 2010). As a simple and available technique, reflexology is widely used in postpartum care because it is non-invasive and requires no specialized equipment (Razmjoo et al., 2012). Unfortunately, some studies have reported contradictory results about the effectiveness of reflexology. Therefore, this subject requires further investigation (Ernst, 2009).

Since relief of post-cesarean pain through methods with fewer complications is of top priority for women, the present study aims to investigate the effect of reflexology on the reduction of pain severity in women undergoing cesarean section.

Methodology

The present randomized clinical trial was conducted from April 21, 2018 to April 21, 2019 in Al-Zahra Hospital of Tabriz, affiliated with

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Tabriz University of Medical Sciences. According to a study conducted by Razmjoo *et al*. (2012), 61 women were selected through the convenience sampling method. One of the participants left the study because her infant was not born healthy. Using a random numbers generator, the participants were assigned to two groups of massage therapy (n=30) and control (n=30). The inclusion criteria were informed consent, safe singleton pregnancy, and undergoing cesarean section. The exclusion criteria included musculoskeletal disorders (MSDs), fractures in the lower extremities during the last three months, the history of massage therapy over the last three months, and taking analgesics and sedatives.

The required data were collected using a two-part tool: the first part consisted of demographics and the second part was the visual analog scale (VAS). The VAS measures the severity of pain on a chart that looks like a ruler and is graded from 1 (no pain) to 100 (most severe pain).

In the first step of reflexology, the patient's feet were warmed up by the physiotherapist. The main massage therapy consisted of dorsiflexion, plantar flexion, and movements of the heel and the shin. In addition, forward and backward movements of foot were used to relax the muscles. Each foot was massaged for 10 minutes 6 hours after the discharge from the recovery unit when the patient was quite conscious. Sesame oil, which has no therapeutic effect, was employed to soften the patient's feet and the physiotherapist's hands. Based on routines, the analgesic dosage administered to each patient was recorded on a special checklist (pethidine was also administered to patients if necessary). Patients participated in three sessions of massage therapy once a day with an interval of 24 hours (Razmjoo et al., 2012). The mean severity of pain was measured 2 hours after the massage therapy. Those in the control group received no special treatment and only participated in a 20-minute conversation with the physiotherapist, aiming at achieving the same conditions for both groups.

The present study was approved by the Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1397.1059) and was registered on the Iranian Registry of Clinical Trials (IRCT20120605009948N6). An informed consent form was obtained from participants and then they were briefed on the research objectives and procedure. They were also assured that they could leave the study at any stage (Abdollahi et al., 2014; Goljabini et al., 2018; Kanbabayi Gol, Zamanzadeh and Jabarzadeh, 2017; Aghamohammadi et al., 2019; Haghdoost, 2019; Khanbabayi et al., 2018).

The data were statistically analyzed in SPSS using the independent *t*-test, the Mann–Whitney U test, chi-square test, Fisher's exact test, and the paired sample *t*-test at the significance level of 0.05.

Results

The mean age of participants was equal to 31.21±5.06 years and their mean gestational age was 281.70±10.81 days. Table 1 shows the results of the independent *t*-test about other demographic information of the participants.

Table 1: Demographic information of the participants

Variable	Groups		Independent *t*-test results
	Control (n=30)	Massage therapy (n=30)	
	Mean ±SD	Mean ±SD	
Age (year)	31.88±5.20	30.29±5.11	P=0.789 t= 0.291 df= 59
Gestational year (day)	275.29±10.01	287.33±11.20	P=0.451 t= 0.736 df= 59
Weight (kg)	75.25±5.90	74.91±5.39	P=0.201 t= 1.118 df= 59
Height (cm)	178.11±21.19	185.35±19.90	P=0.251 t= 1.171 df= 59

The results indicated that 91.66% of pregnancies were intended and 70% of participants were primiparous. In addition, 13.33% of participants had a history of cesarean section. The frequency of pregnancy type and number and delivery type is presented in Table 2.

Table 2: Frequency of pregnancy type and number and delivery type among the participants

Variable		Groups			Test
		Massage therapy (n=30)	Control (n=30)	Total (n=60)	
		Number (%)	Number (%)	Number (%)	
Intended pregnancy	Yes	27(90)	28(93.33)	55(91.66)	Fisher's exact test
	No	3(10)	2(6.67)	5(08.34)	x^2=0.671
	Total	30(100)	30(100)	60(100)	df=1
					P=0.652
Number of pregnancies	1	20(66.66)	22(73.33)	42(70)	Chi-square test
	2	10(33.36)	8(26.66)	18(30)	x^2=0.555
	Total	30(100)	30(100)	60(100)	P=0.611
History of cesarean section	Yes	5(16.66)	3(10)	8(13.33)	Fisher's exact test
	No	25(83.34)	27(90)	52(86.64)	x^2=2.151
	Total	30(100)	30(100)	60(100)	df=1
					P=0.118

The results of the independent *t*-test indicated that the mean severity of pain significantly reduced in the massage therapy group on all three days studied after the intervention ($p \leq 0.003$) (Table 3).

Table 3: The mean severity of pain in massage therapy and control groups

Study day		Groups		Independent *t*-test results
		Massage therapy (n=30)	Control (n=30)	
		Mean ±SD	Mean ±SD	
First day	Before the intervention	66.25±11.29	65.03±11.20	t = 0.239 P= 0.829
	After the intervention	41.19±10.25	71.90±13.39	t = 2.30 P= 0.001
Second day	Before the intervention	50.15±10.30	65.90±12.20	t = 1.31 P= 0.001
	After the intervention	39.81±10.20	63.65±12.11	t = 2.29 P= 0.001
Third day	Before the intervention	45.42±10.10	59.25±09.88	t = 0.991 P= 0.003
	After the intervention	29.30±08.11	50.91±08.30	t = 2.55 P= 0.001

Discussion

The results of this study showed the decreasing effect of foot reflexology on post-cesarean pain. According to the results, patients in the control group experienced severe pain on all three days after the cesarean section, whereas the severity of pain decreased day by day in the massage therapy group. Based on demographics, there was no significant difference between the two groups. This means that the participants were randomly assigned to the two groups and random allocation was properly done.

Consistent with previous studies (Ashabiya and Solomon, 2018; Hassani and Hassani, 2015; Moghimi-Hanjani, Mehdizadeh-Tourzani and Shoghi, 2015), the present study suggested the positive and beneficial effects of reflexology on pain relief. Since foot reflexology causes the natural secretion of morphine in the body, it is believed that this technique can exhibit analgesic effects and relieve postoperative pain.

However, some other studies have reported that foot reflexology has no positive and beneficial effect on the reduction of postoperative pains (Mousavi, Golmakani and Saki, 2016; Sepehrirad, Bahrami and Noras, 2016). This difference can be attributed to the surgery type, duration, and site as well as massage technique. Massage therapy in different surgeries may have different effects on pain relief and it is obvious that massage therapy cannot relieve extreme and uncontrollable pains.

In the present study, foot reflexology exhibited short-term effects on pain relief and patients experienced more severe pain on the day after the massage therapy. Previous studies have also corroborated the short-term analgesic effects of this technique (Lalehgani, Rafiei and Yarmohmadi, 2018; Keller, 2012).

Although it is still unknown how foot reflexology relieves pains, it seems that this technique induces analgesia by making physiological changes to release endorphins. Based on the neuromatrix theory of pain, reflexology may alter the experience of pain by changing the chemical carriers and hormones involved in pain control and releasing endogenous opioids that result in analgesia or pain relief.

As one of the main weaknesses of this study, the type and dosage of analgesics were not taken into account. Therefore, future studies are recommended to focus on the anesthetic method, type of analgesic, and the last analgesic administered to patients in the operating room.

Conclusion

The study findings suggested that short-term foot reflexology reduced post-cesarean pain. Since foot reflexology is a simple method, it is recommended to be included in health care programs.

Conflict of Interests

None.

Ethical Issues

The research project was approved by the Ethics Committee (ethics no. IR.TBZMED.REC.1397.1059-IRCT No: IRCT20120605009948N6).

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