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The Effect of Foot Reflexology on Physiologic Indices and Pain Severity Following Cesarean Delivery

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Abstract: Foot reflexology is used in patients following cesarean delivery with the aim of adjusting vital signs and pain through inducing physical and psychologic relaxation. Therefore, this study was performed with the objective of assessing the effect of foot reflexology on physiologic indices and pain severity after cesarean study. The study had a quasi-experimental design. The study population consisted of all women who were hospitalized in the Obstetrics Department of Imam Reza Hospital, Kermanshah, Iran due to cesarean delivery. Of this, 20 were selected by convenient sampling and were randomly divided into two groups (10 in experimental group and 10 in control group). The required data were gathered and inserted into a checklist by interviewing and measuring vital signs. The data were analyzed by the Analysis of Variance (ANOVA) and post-hoc Tukey's test. The results indicated that there was no significant difference between the two studied groups on day 1 (before starting the intervention) regarding pulse rate, systolic blood pressure, diastolic blood pressure, respiratory rate and temperature. But, on day 1 post-intervention and also when comparing the results on day 2 with the data on the first day, significant difference existed between the two groups. The results showed that foot reflexology can be a useful and effective Non-Pharmacological Method in decreasing pain and adjustment of physiologic indices (respiratory rate, temperature, pulse rate and blood pressure) amongst women after cesarean delivery.

Key words: Foot reflexology, cesarean delivery, physiologic indices, pain severity, delivery

INTRODUCTION

Now a days, the number of cesarean delivery as one of the most common surgical operations amongst women is rising in Iran reaching to 40-50% of prevalence in public hospitals. Pain is a common phenomenon happening after all surgical operations (McClean and Cooper, 1990) and surgical operations are among the causes of generating acute pain such that one of the main complaints of patients who have undergone abdominal surgeries is the post-operative pain (Hoseyni *et al*., 2003). Pain alleviation following cesarean delivery is so important regarding the increasing risk of thromboembolic diseases which may be intensified due to inactivity resulting from post-cesarean pain. Unrelieved acute pain will lead to the outbreak of more complications such as prolongation of hospitalization, severer inability and complications resulting from experiencing intense pain or nausea, respiratory problems, decrease in enteric activity return, higher risk of deep veins thrombosis, damage to pressure points and intestinal impacts (Perry and Potter, 1995).

One of the most prevalent interventions in pain alleviation is the use of painkillers (Mobily *et al*., 1994). Although, the injection of narcotic drugs generates desirable relieving impacts, they increase the risk of complications including lowering blood pressure and respiratory depress. Analgesics are not always available for patients. Moreover, according to Grealish *et al*. (2002), analgesics could not solely be regarded as an appropriate painkiller. In addition, prohibition from excessive drug use especially analgesics necessitates nurses and other people in treatment team to use alternative painkilling methods to lessen the pain suffered by patients (Zamiri, 2002). One of the painkilling interventions is the use of alternative (supplementary) care methods (Memarian *et al*., 2001). Most of these interventions are inexpensive, easy to use and have less complications and risks. They can be used solely or accompanied by other methods (Hoseyni *et al*., 2003).

Reflexology is a non-pharmacological and handy healing technique which has been used in some studies to reduce pain and anxiety in post-operative situations. Reflexology is a simple, handy and non-offensive technique which needs no special facilities that now a days has gained the wide range consent of mothers in maternal cares (Mirzaee *et al*., 2010). Some studies showed that massaging leads to increase in blood flow;

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improves lymph flow in lymphatic vessels; improves muscular, skeleton system and has sedating impact on the mind (Shiri, 2011). Although, many studies have been conducted on the effect of foot reflexology on pain and physiologic indices, most of them had focused on chronic, pain or cancer-induced pain (Stephenson *et al*., 2007; Khan *et al*., 2006; Quinn *et al*., 2007; Brown and Lido 2008; Wilkinson *et al*., 2006) while few have dealt with its effect on the post-operative pain.

Therefore, regarding the importance of painkilling and the change in physiologic indices in women following cesarean and also the non-existence of the similar study on the effectiveness of foot massage reflexology following cesarean, the present study was performed with the objective of assessing the effect of foot reflexology on physiologic indices and pain severity after cesarean delivery in women who were hospitalized in the Department of Obstetrics of Imam Reza Hospital, Kermanshah, Iran.

MATERIALS AND METHOD

The study had a quasi-experimental design performed to investigate the effect of foot reflexology on physiologic indices and pain severity after cesarean delivery in women who were hospitalized in Imam Reza Hospital, Kermanshah, Iran. The population study consisted of all patients who were hospitalized in the Obstetrics Department of Imam Reza Hospital, Kermanshah, Iran, due to cesarean delivery who did not have acute orthopedic ankle problem; had no history of foot reflexology treatment; had no addiction to drugs, painkillers and alcohol and also had a consciousness level and did not have diabetes history. Of them 20 available patients were selected and were randomly put in two groups of 10 persons (control, foot massage experiment). The pre-intervention vital signs were measured and registered 5 min before the intervention, until the intervention began. Then, the experimental group was foot massaged in ankle area downward for 5 and 2.5 min for each foot. The SPSS software version 18 was utilized for data analysis of descriptive-analytic statistics. In order to compare the physiologic indices in the two groups, they were analyzed by the variance (ANOVA) and post-hoc Tukey's test in the first and second days before and after intervention.

RESULTS

The results indicated that the mean (standard deviation) age of participants in the experimental and control groups was 27.10 (6.15) and 29.32 (6.07) years, respectively. The highest education level in control and experimental group was lower than high school diploma and high school diploma, respectively. The results of the ANOVA showed that there was a significant difference between the mean pulse rate, systolic blood pressure, diastolic blood pressure, respiratory rate and temperature in the two groups one day before the intervention but in terms of pain severity, no significant difference was observed ($p>0.05$). However, in the first day after the intervention, there was a significant difference between the mean pulse rate, systolic blood pressure, diastolic blood pressure, respiratory rate, temperature and pain intensity between the two groups ($p<0.01$). The results unveiled that in the second day before and after the intervention, there was a significant difference between the pulse rate mean, systolic blood pressure, diastolic blood pressure, respiratory rate, temperature and pain intensity in the two groups ($p<0.01$). The results taken from post-hoc Tukey's test showed that the pulse rate mean, systolic blood pressure, diastolic blood pressure, respiratory rate, temperature were different in the first and second days before and after the intervention in the two groups (Table 1).

Table 1: Comparison of pulse rate, systolic blood pressure, diastolic blood pressure, respiratory rate, temperature and pain severity on days 1 and 2 based on measurement unit (rate per minute) before and after intervention using one-way analysis of variance

Groups	Control M±SD	Experimental M±SD	Results p, F
Pulse rate			
Day 1 before intervention	6.779±97.80	8.695 ± 94.4	(F = 2.233, p = 0.101)
Day 1 after intervention	2.59±87.40	1.080±92.50	(F = 5.105, p = 0.005)
Day 2 before intervention	6.779±97.80	8.695±94.40	(F = 2.233, p = 0.101)
Day 2 after intervention	2.59±87.40	1.080±92.50	(F = 5.105, p = 0.005)
Systolic blood pressure			
Day 1 before intervention	2.348 ±93.10	2.251± 92.203	(F = 0.225, p = 0.878)
Day 1 after intervention	1.080± 94.50	1.080± 92.50	(F = 16.132, p = 0.000)
Day 2 before intervention	0.713± 104.40	1.932± 108.80	(F = 12.827, p = 0.001)
Day 2 after intervention	1.494± 107.30	2.710± 120.7	(p = 0/001, F = 91/846)
Diastolic blood pressure			
Day 1 before intervention	2.424± 62.90	0.966± 60.60	(F = 2.23, p = 0.10)
Day 1 after intervention	1.578± 64.40	0.816± 67.0	(F = 5.105, p = 0.001)
Day 2 before intervention	0.699± 70.40	0.850± 71.50	(F = 62.828, p = 0.000, 0/000)
Day 2 after intervention	1.252± 73.70	1.430± 75.40	(F = 40.822, p = 0.000)

Table 1: Continue

Groups	Control M±SD	Experimental M±SD	Results p, F
Respiratory rate			
Day 1 before intervention	1.252±18.30	0.944±17.90	(F = 0.205, p = 0.892)
Day 1 after intervention	0.919±18.20	0.966±16.60	(F = 9.398, p = 0.001)
Day 2 before intervention	1.059±17.30	0.949±16.30	(F = 4.397, p = 0.001)
Day 2 after intervention	1.767± 16.30	1.767±13.30	(F = 8/566, 8.566, p = 0/001, 0.001)
Pain severtiy temperature			
Day 1 before intervention	0.2394±36.780	0.2539±36.800	(F = 0431, p = 0.732)
Day 1 after intervention	0.2234±36.790	0.2558±37.290	(F = 17.373, p = 0.001)
Day 2 before intervention	0.1269±36.950	0.1059±37.330	(F = 45.576, p = 0.000)
Day 2 after intervention	0.966±37.140	0.0823±37.530	(F = 58.509, p = 0.001)
Day 1 before intervention	6.896±42.00	7.184±41.50	(F = 0.019, p = 0.996)
Day 1 after intervention	7.260±40.40	3.725±30.10	(F = 11.814, p = 0.001)
Day 2 before intervention	6.088±35.80	5.441±29.60	(F = 3.563, p = 0.001)
Day 2 after intervention	6.339±31.80	3.342±14.50	(F = 11.814, p = 0.023)

DISCUSSION

The results of the study showed that there is no significant difference between the mean physiological indices of pulse rate, systolic blood pressure, diastolic blood pressure, respiratory rate, temperature of the two groups on the 1st day before intervention but significant statistical differences was observed in the two groups on the 1st day after intervention and on the 2nd day before and after intervention. There seemed no significant difference among the test group and the control group regarding the mean pulse rate before message being in line with the study conducted by Shaban *et al.* (2005). In addition, the study done by Imani *et al.* (1999) approved the present study. Other findings of the this study showed that there is no significant difference between the two groups in terms of the respiration rate before messaging which is consistent with Hajihoseyni *et al.* (2007) and Hayes and Cox (1999). Also, no significant difference was observed in the two groups between systolic and diastolic blood pressure before messaging, however, in the 1st day after intervention and the 2nd day before and after intervention, the difference was significant being in line with Hajihosseini *et al.* (2007) and Hayes and Cox (1999). Since, complications may arise following medullar anesthesia induction, careful clinical supervision on vital signs is necessary because the blood pressure drop resulting from vasodilatation is caused by sympathetic block and venous blood return disorder. The bloodletting following cesarean delivery leads to relative changes by increasing pulse rate and decreasing in blood pressure. The results of temperature means of the patients showed that there is significant difference between the temperature mean of the first day before intervention and the 2nd day before and after intervention and after intervention following foot reflexology with the increase in temperature mean in the experimental group compared with control group respectively, meaning that the temperature had been raised in the test group. Following messaging, the skin temperature raises and this increases the blood under skin and muscles which is a beneficent physiologic element in naturalizing the skin temperature. The results showed that the mean temperature before messaging is not statistically significant. The studies done by Imani *et al.* (1999) and Hayes and Cox (1999) are consistent with the current study' results.

Temperature is dependent upon factors such as the weather condition, different times of the day and night, sleep cycles, water and liquid consumption and, etc. In this study, the patient could start hydrotherapy the morning after the surgery operation which can be effective in increasing the temperature.

Comparing the mean samples based on pain intensity index in day 1 and 2, it was indicated that on the first day before intervention, there is no significant difference between the two groups in terms of pain intensity. But, in the first day after intervention and the 2nd day before and after intervention, the mean pain intensity difference was significant between the two groups. Also, regarding the mean total pain intensity, although there seemed no significant difference between the foot reflexology group and the control group in the first day before intervention, in the 1st day after intervention and the 2nd day before and after intervention, significant difference was observed being in line with the findings of Poole *et al.* (2007), Kesserling *et al.* (1998) and Wang and Keck (2004).

CONCLUSION

Based on the findings of this study, it could be concluded that foot reflexology message if done carefully and regularly can modify physiological variables of patients who are hospitalized in cesarean operation wards. Reflexology message will bring about systemic and local physiological changes in the body and will lead to a deep sense of mind and bodily relaxation and balance that minimizes the relevant symptoms of stress. Most patients report to have increased sense of wellbeing and general

health following the reflexology treatment (Shiri, 2011). In addition, the reflexology operation can stimulate endorphin and enkephalin which is a natural painkiller and a mood booster (Taghlili, 2005). Reflexology is effective in improving muscles' comfort by enhancing blood flow which stimulates parasympathetic nerve system. It can also reduce pharmacologic complications and improve the nurse-patient relationship. Using short-term foot reflexology message and emphasizing on the short-term application of this method and non-interference with the treatment process and the considerable simplicity of this method and also the applicability of it by nurses, physicians, physiotherapists and even the patients attendants, significant results could be obtained in quick physiologic and psychological remission of the patients and patients care improvement in surgery wards particularly for women following cesarean delivery.

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