Original Article

The Reflexology of Sole on Tiredness Intensity in Pregnant Women

Fatemeh Ghaffari (MS) [*1]
Taiyebeh Pour Ghaznein (MS) [2]

Abstract

Background: *Tiredness is one of the most common complaints among pregnant women, but little attention has been paid to its importance and a way to control it. Reflexology can be employed as a nursing intervention to reduce it. The purpose of this study was to determine the effect of reflexology on the tiredness intensity in pregnant women.*

Methods: *This study was carried out on 74 pregnant women outpatients in Health centers in Ramsar. These women were divided into two groups of test (36 people) and witness (38 people) which were matched according to their ages and jobs. The instrument for collecting data included sample choice form, individual characteristics, social support and a questionnaire for analyzing tiredness intensity. When the forms were filled up by the research units, the reflexology of sole was done in the test group for 5 weeks, two sessions a week, 30 minutes each session; then the tiredness intensity of both groups was analyzed again. The analysis was performed using the following tests: Chi square statistical test, student t, paired t and Pearson correlation coefficient.*

Results: *In this study the average of tiredness intensity in pregnant women showed a significant difference before and after the reflexology, and after the interaction there was a significant difference in tiredness intensity between the two groups of witness and test (p=0.001). There is a significant relationship between social support and tiredness intensity (r=0.46, p=0.002). Likewise, ferros sulfate tablet had a significant effect on tiredness intensity (p=0.001).*

Conclusion: *According to the present study reflexology reduces tiredness in pregnant women significantly. The other variables such as social support and sulfate ferros tablet can reduce tiredness intensity too.*

Key words: *Reflexology, Pregnancy, Fatigue.*

Casp J Intern Med 2010; 1(2): 58-62.

1- Faculty of Nursing & Midwifery, Babol University of Medical Sciences, Ramsar, Iran.
2- Faculty of Nursing & Midwifery, Mashad University of Medical Sciences, Mashhad, Iran.

*** Correspondence:**
Fatemeh Ghaffari, Faculty of Nursing & Midwifery, Babol University of Medical Sciences, Ramsar, Iran.
Post Code: 46917-14141
E-mail: ghafarifateme@yahoo.com
Tel: +98-1925225151
Fax: +98-1925222423

Received: 8 Feb 2010
Revised: 10 April 2010
Accepted: 25 May 2010

Pregnancy is a physiological phenomenon which is accompanied by many changes in the different systems of the body. According to the World Health Organization (WHO) , there are more than 200 million pregnancies in the world each year. Nearly half a million of these mothers die because of the side effects of pregnancy, lack of care and attention in childbirth. In Iran 2200000 women in their fertility age become pregnant and need medical care and help to solve their problems in pregnancy (1,2). The main purpose in period of pregnancy care is to find out the problems of the mother and the fetus and to take the necessary precautionary measures. It is necessary to identify the physical and psychological aspects influencing the pregnant women's health that differentiate the natural and unnatural cases in order to provide a healthy family and social environment. Tiredness is one of the common problems of pregnant women whose mechanism has not been understood thoroughly. According to psychological principles and the ideas of some of the researchers, tiredness is one result of the disturbance in energy balance in the body which in turn is a consequence of hormonal, metabolic, spiritual compatibility, emotional and physical changes or some diseases during pregnancy (3, 4).

The increase in tiredness can lead to some problems during pregnancy, at the time of delivery or even after it. These problems include increase in the number of premature births, reduction in the baby's weight at birth, increase in the reduction of delivery, more deliveries by vacuum or forceps, caesarean birth and the depression after childbirth (3-6).

Luke's study showed that tiredness score is an effective factor on premature birth (7) and in Neshat's study, he pointed out that "baby's weight at birth is one of the most important factors in determining the state of public health in a society, and taking the weight of the baby into consideration, but little attention has been paid to tiredness" (8). Also, tiredness can cause the weakening of the memory, concentration, motivation, cooperation, spirit, kindness, judgment, decline in operational quality, indifference to people, which brings about irreparable damage to the person, family and society" (4,5). Chien's study (2004) showed that tiredness is a serious problem in pregnant women and can increase the number of caesarean births (6). One of the important affairs that can be taken as a nursing intervention to reduce tiredness is the reflexology of sole (7, 9,10).

The first healthcare provider known to have practiced reflexology in the United States is Dr William Fitzgerald who introduced his theory of "zone therapy" in 1913. He believed that there are 5 longitudinal zones in the body, with zone1 being in the center of the body. He designated the big toe and the thumb as zone 1. Zone 5 was represented by the fifth toe and the fifth finger. Dr William Fitzgerald believed that organs lying within zone 1 could be stimulated by applying pressure to the reflex areas of the feet in zone1. In the 1930s, Eunice D. Ingham, a physical therapist, became interested in zone therapy and made her own adaptations to Fitzgerald's zone therapy. Some believe that reflexology stimulates the circulatory system, which, in turn, allows more blood flow, an increased sense of well-being, and better healing potential. Some believe it has more to do with stimulating the lymphatic system to release body toxins, while others believe stimulation of the nervous system allows for better energy (11). Reflexology is a vigorous massage in certain parts of the body that can be effective in relieving pain and eliminating certain physiological problems and particular pregnancy complaints and also relieves nerves in the different organs of body (12).

One of the things the reflexology is taught to do is to stimulate the body to rid itself of waste products of metabolism on the cellular level through lymphatic, respiratory, excretory, and circulatory systems. This concept is similar to the effects of massage (11). Nowadays, most of the reflexologists' explanation help in its cure. Some of them say that in touching the feet, the amount of lactic acid decrease in the tissues of the body. Meanwhile, the release of small crystals of calcium that have accumulated at the end of the nerves of the feet freely flows up energy even to equal organs. Reflexology can be used as a comprehensive approach, a nursing intervention and a scientific method that supports traditional supervisions that is accompanied by medical treatment. In recent years, its validity has been confirmed (13,14). This can be functional improvement to the neuron-endocrine system and process of homeostatic. Toxins are removed and the body's innate powers of healing are activated. This is related to the individual's regenerative powers (15). On the basis of the researchers' observations and the studies done into the prevalence of tiredness and its effects on pregnant women, since reflexology is a non-invasive hands-on modality, it can become a wonderful adjunct to any nurse's skills set. This study has been carried out to determine the effect of reflexology of sole on tiredness intensity of pregnant women outpatients at the Health and Medical Centers in Ramsar.

Methods

The sample size was calculated to be 29 cases in each group based on two mean comparison formula and 95% confidence regarding standard deviation and fatigue average of pilot study (s_2=10.4, m_2=62, s_1=9.6, m_1=70.5, α=0.05, β=0.1). In order to avoid the decrease of research units we accidentally chose 45 cases for each group (case and control) in Healthcare Centers and at the end of study, 36 individuals were enrolled in case group and 38 in control group.

This two group clinical trial study was performed on pregnant women admitted to primary Healthcare centers from July to November 2005. The matched-pair sampling was completed in two groups of case and control and the cases were matched according to age and occupation in both groups. Each individual signed a written consent and for those with gestational age less than 18 and more than 30 weeks suffering from diseases or drug administration which somehow affects fatigue, having a physically handicapped child or husband, depression, anxiety or stress grade more than normal, illiterate, with thyroid malfunction, an evidence of anemia, high risk pregnancy and re-location within the last two months were excluded from the study. The sample size was calculated to be 29 cases in each group based on

two mean comparison formula and 95% confidence regarding standard deviation and fatigue average of pilot study (s_2=10.4, m_2=62, s_1=9.6, m_1=70.5, α =0.05, β =0.1). The data were collected using sampling form (inclusion criteria and depression, anxiety and stress concurrent definition scale), demographic characteristics form, social support scale and questionnaire of fatigue intensity evaluation. The questionnaire for fatigue intensity included 30 questions and grades were based on a four-point linkurt scale from 1 to 4. The grades range from 30 to 120. Its validity has been confirmed by Pouch and Milligan in the US and Neshat has also confirmed its construct validity in 2001 (8,16). Neshat has also evaluated its reliability with α of krunbakh and with an r=0.88 the internal consistency was confirmed. In the present study, Pierson correlation index was calculated 0.82 which revealed instrument stability throughout time. The social support scale included 7 questions and in 3-point scale it was calculated from 0 to 2, its validity and reliability was confirmed by Korkeabadi in 1995 (17).

The depression, anxiety and stress correlation scale included 21 questions and with 4-point scale it was graded from 0 to 3. Its validity was confirmed using construct validity and the reliability was confirmed with re-testing and r=0.90 by Sahebi in Mashhad (8). After the researcher got an official permit from the Head of Ramsar Healthcare Center Organization, she went to the centers for sampling for the pregnant women admitted in the services of Mother-Child Hygiene Unit. After introducing the research objectives and taking their written consent, the proper cases were chosen and the demographic and fatigue scale questionnaires were handed over. When the forms were completed, they were randomly divided into 2 groups. The reflexology steps and duration of the program was declared for the case group, and then reflexology was performed by the researcher and two highly skilled assistants. It was also stated that this technique continued twice a week for 5 weeks each session lasted for 30 minutes, twice in Healthcare centers and the rest at home. The individuals were asked to lie down in the examination bed in a quiet and bright room, closed their eyes and were in a relaxed condition. Then after gentle massaging of the foot, the heel was held with the left hand and by pressing the sole it was bent back and forth from the ankle and a direct push on the solar plexus point with the thumb (picture 1).

This method was performed within 30 minutes for both feet and then they were asked to take lots of liquids during the following 24-48 hours. At the end of 5 weeks, fatigue intensity scale was completed again by both groups. The data was analyzed using SPSS and p<0.05 was considered significant. Chi-square and paired t tests were also used.

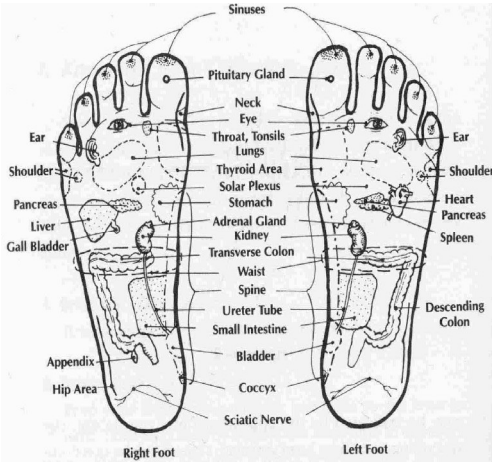

Fig1: reflex points of the plantar

Results

In this study, the two groups were paired according to their ages and jobs. The average age in the test group was 25.2±6.22 and 27.02±6.02 in the witness group. Most of the research units (80.6% in test group and 71.1% in witness group) were housewives. With regard to other variables, the two groups were homogeneous. According to the finding of this study, before the intervention, most of the units in the two groups (55.6% of test group and 65.8% of witness group) had a medium tiredness intensity and K square test did not show a significant difference in the two groups with regard to tiredness intensity (table 1).

Table 1: Frequency distribution of pregnant women in witness and test groups on the basis of tiredness intensity before reflexology of sole.

Group / Intensity	Test N%	Witness N%	Total N%
Light	12 (33.3)	8 (21.1)	20 (27)
Middle	20 (55.6)	25 (65.8)	45 (60.8)
Severe	4 (11.1)	5 (13.2)	9 (12.2)
Total	36 (100)	38 (100)	74 (100)
	P=0.493	df=2	X^2 = 1.41

The paired test showed a significant difference between mean and standard deviation of tiredness intensity of test group before and after reflexology (Table 2).

Table 2: Frequency distribution of pregnant women in witness and test groups on the basis of tiredness intensity after reflexology of sole

Group Intensity	Test N%	Witness N%	Total N%
Light	20 (55.6)	8 (21.1)	28 (37.8)
Middle	20 (44.4)	21 (55.3)	37 (50)
Severe	0 (0)	9 (23.7)	9 (12.2)
Total	36 (100)	38 (100)	74 (100)
	P=0.001	df=2	X^2 =14.77

But there was no significant difference between the mean and the standard deviation of tiredness intensity in the beginning and at the end of the study in witness group (table 3). The findings of this study showed that the social support has a significant relationship with tiredness intensity (r=-0.46, p= 0.002), that is, those who had a higher social support score, had a lower tiredness intensity. In addition, ferrous sulfate had a significant effect on tiredness intensity (t= -11.39, p=0.00). Therefore, those who used ferrous sulfate had a lower tiredness intensity. In this study the rest of the variables did not have any significant relationship with tiredness intensity; these variables included: education, economic state, sports activities, age, job, the number of deliveries, the number of pregnancies, the number of family members, sleeping hours in a day, satisfaction with sleeping and the distance between home and the Medical Center.

Table 3: The comparison of mean and standard deviation of tiredness intensity before and after the reflexology of sole in pregnant women in two groups of test and witness

Group Time	Test Mean±SD	Witness Mean±SD	Total Mean±SD
Before reflexology	63.38±12.43	70.26±14.96	66.91±18.88
After Reflexology	55.25±13.40	70.73±14.54	63.25±19.74
	T=4.93 df:35 P=0.000	T=-1.52 df:37 P=0.136	T=3.57 df:73 P=0.001

Discussion

Although tiredness has always been mentioned as a common problem in pregnant women, it has hardly been studied. The findings of Chien and Ko (2004) from a study on 636 pregnant women with 20 to 36 weeks of pregnancy showed that tiredness is a serious problem among pregnant women. It is also one of the factors that can increase the numbers of caesarean births (6). The findings of the present research showed that most of the units in the two groups had medium tiredness intensity despite the little attention that has been paid to possible interventions to control it (6). The reflexology of the sole can be used as a nursing intervention to reduce tiredness (9). Among the researches inside Iran or in other countries, there has been no study done into the effect of reflexology of the sole on tiredness intensity in pregnant women, but the result of Lee and Sohng's study (2005) on 29 patients suffering from pneumonoconiosis showed that reflexology of sole had a significant effect on tiredness and sleeplessness (9). Yang's study (2005) on 16 patients who were suffering from cancer and were being treated through chemotherapy demonstrated that reflexology of sole can reduce tiredness significantly (18). The findings of the present study showed that the average score of tiredness intensity before and after reflexology had a significant difference between the two groups of test and witness.

Chien's study showed that childcare and household chores were among the effective factors on tiredness, in his study, the women were divided into three groups: housewives, employees who sit most of the time and are not very active and physically active employees. The result of the study showed that pregnant housewives feel more tired than those with not very physically demanding job. He believed that more attention should be paid to pregnant housewives (6).

The results of Neshat's research showed that tiredness intensity was higher in working women (8), and it was seen in Luke's study, that the number of premature births was higher in working women, which had a significant relationship with daily working hours and tiredness intensity. In Water's study, there was no significant difference in tiredness intensity between working women and housewives (5); the results of the present study showed no significant difference in tiredness intensity between the working pregnant women and the housewives. Maybe this difference in the result is because of the grouping of work on the basis of activity and working hours. Therefore, it is better to study the kind of work and the working hours carefully, in order to analyze tiredness intensity in pregnant women. The results of Neshat's study showed that those who use ferrous sulfate

have a lower tiredness intensity (8); where the results of the present study showed the same results. In this study, the regular sports activities had no significant effect on tiredness intensity, whereas in Horn's study, it showed that pregnant women who took part in a sport activity regularly, experienced a lower tiredness intensity (19) while in Neshat's study it showed that the sports activity causes more tiredness (8). This difference was probably because of the kind of sport, resting time and the sports activity. In this study, social support had a significant negative relationship with tiredness; therefore, tiredness was lower in those who had a better social support. In Neshat's study there was a significant negative relationship between tiredness and social support (8). Other variables had no significant effect on tiredness intensity. Since these variables have not been analyzed in other studies, it is a good idea to study the effective factors on tiredness intensity in pregnant women. It can be said that, according to the results of this study, reflexology reduced tiredness in pregnant women significantly.

Acknowledgement

We would like to thank the Head of Ramsar Hygiene Network and Pregnancy Clients.

Reference

1. Saheb Kashaf, H, Almasi Nokiani, F. "Health in during of pregnancy" 3rd edition. Tehran, SAMMAT publisher, 1998; p: 2.
2. Cunningham F, Gant N, Levno K, Gilstrap L, Hauth J, Wenstrom K. Williams obstetrics. 21 st edition 2001; McGraw-Hill Companies, pp: 16.
3. Pugh LC, Milligan R, Parks PL and et al, clinical approaches in the assessment of childbearing fatigue, JOGNN. 1999; 28: 74-80.
4. Varny H, Varney's Midwifery, 3rd edition, Boston, Jones and Bartlett 1997; p: 12-18.
5. Waters MA, Lee KA, Differences between primigravidae and multigravidae mothers in sleep disturbances, fatigue and functional status. J Nurse- Midwifery, 1996; 41: 364.
6. Chien LY, Ko YL. Fatigue during pregnancy predicts caesarean deliveries, J Adv Nurse 2004; 45: 487-94.
7. Luke B, Mamelle N, Keith L, et al. The association between occupational factors and preterm birth a united State Nurses study. Am J obstet Gynecol. 1995; 173: 849-62.
8. Neshat, Ramesh. "Comparative survey of density of tiredness in 3 months of third of pregnancy in occupying and housewife women visiting to central meditations of period of pregnancy in Mashhad City, in 2001". Thesis of nursing and midwifery, Mashhad university of medical sciences.
9. Lee YM, Sohng KY. The effects of foot reflexology on fatigue and insomnia in Patient suffering from coal worker's Pneumo Coniosis, Taehan Kanho Hakhoe chi. 2005; 35: 1221-8.
10. Stephenson NL, Dalton JA. Using reflexology for pain management, J of Holist Nurs. 2003; 21: 179-191.
11. Blunt, E. Foot reflexology, Holist Nurs Pract, 2006; 20: 257-9.
12. Ferrer de Dios R. Reflexology. Rev Enferm. 2005; 28: 42-6.
13. Lee YM. Effect of self-foot reflexology massage on depression, stress responses and immune function of middle aged women. Taehan Kanho Hakhoe chi 2006; 36: 179-88.
14. Quattrin R, zanini A, Buchini S, et al. Use of reflexology foot massage to reduce anxiety in hospitalized cancer patients in chemotherapy treatment: methodology and outcomes. J nurs manag. 2006; 14: 96-105.
15. Mitchell A, Cormack M. The therapeutic Relationship in Complementary Health Care. 1th edition. 1998; London. Churchill Livingstone, 1998; pp: 54.
16. Pugh LC, Milligan RE. Patternes of fatigue during childbearing, Applied nursing research 1995; 8: 140-3.
17. Karkeh Abadi M. A comparative survey of the degree of depression in occupying and housewife mothers in Mashhad City, 1995. M.S thesis in nursing and Midwifery College in Mashhad University of medical sciences.
18. Yang JH. The effects of foot reflexology on nausea, vomiting and fatigue of breast cancer patient undergoing chemotherapy, Taehan Kanho Hakhoe chi, 2005; 35: 177-85.
19. Horns PN, Ratcliffe IP, Legget JC, Swanson MS. Pregnancy outcomes among active and sedentary primiparous women. JObstet Gynecol Neonatal Nurs. 1996; 25: 49-54.