

EFFECT OF FOOT REFLEXOLOGY ON PREMENSTRUAL SYNDROME

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Abstract

Background: Premenstrual Syndrome (PMS) is a set of physical, emotional and behavioral symptom that start during the week preceding menstruation and are alleviated when the menstrual flow begins. Reflexology is one of the most popular complementary therapies. As it stimulates the release of endorphins, the body's painkilling chemicals and diet rich in vitamins and calcium, decrease in oil and restrict caffeine also used in treatment. **Purpose:** This study was aimed to determine the effect of foot reflexology in the treatment of premenstrual syndrome. **Subjects and methods:** Fifty volunteer, single females with premenstrual syndrome (PMS) were selected randomly from outpatient clinic of obstetrics and gynecology in Abnub Hospital in Assuit to share in this study, their age ranged from 18 to 25 years old and their body mass index (BMI) did not exceed 30kg/m², the participants were assigned into two groups of equal numbers. The group (A) received therapeutic foot reflexology with dietary modification 3 times/week for 8 weeks, while the group (B) received dietary modifications only for 8 weeks. All subjects in both groups were assessed through the visual analogue scale (VAS) for pain. Premenstrual Daily Symptoms Questionnaire for (PMS) related symptoms. **Results:** The results of the present study revealed that there was statistically significant improvement in both pain and premenstrual related symptoms in group (A) than in group (B). **Conclusion:** Foot reflexology with dietary modification is an effective method for reducing symptoms associated with premenstrual syndrome.

Key words: Premenstrual syndrome- Dietary modification- Foot reflexology- Girls.

Introduction

Premenstrual syndrome (PMS) is a combination of physical and emotional disturbance that affect 20-80% of women of reproductive age (Khajehi, 2015).

Many women feel physical or mood changes during the days before menstruation. Common symptoms of PMS includes: Emotional symptoms as: depression, irritability, angry, crying spells, anxiety, confusion, social withdrawal and insomnia and Physical symptoms as: thirst, food cravings, breast tenderness, bloating, headache, fatigue, abdominal pain, skin problems and gastrointestinal tract problems (ACOG, 2015).

Premenstrual syndrome is characterized by somatic symptoms as fatigue, appetite changes and low energy and psychological symptoms as irritability, depressed mood, anxiety and impulsive behavior. Typically, symptoms remit within a few days after the onset of menstruation. Approximately 10 % of women with PMS experience a very severe form called premenstrual dysphoric disorder (PMDD) (Hartlage et al., 2012).

The etiology of PMS and PMDD is largely idiopathic. Because PMS symptoms are closely related to the menstrual cycle and only affect women of reproductive age, sex hormones have been suggested to play a causative role. However, a large body of evidence indicates that women who are vulnerable to premenstrual mood changes do not have abnormal levels of sex hormones (Epperson et al., 2012).

Women with mild-to-moderate PMS symptoms often do not require treatment. However, treatment is often warranted in women with PMDD due to its impact on social functioning. Treatment options include conservative treatment, medical treatment, hormonal treatment, psychological treatment,

relaxation treatment, surgical treatment, complementary treatment, physical therapy treatment and alternative treatment (Rapkin, 2003).

Dietary supplements have a good effect in reducing symptoms of PMS in women included vitamins (A, E, and B6), calcium, magnesium, multivitamin/ mineral supplements, and evening primrose oil (Wyatt et al., 2000).

Reflexology facilitates homeostasis and relaxes the body, mind and spirit. It is effective in helping to diminish a variety of adverse symptoms such as stress, fatigue, pain, and tension and helps with anxiety and depression (Xavier, 2007).

Subject, materials and methods

This study was carried out on fifty volunteer, single females diagnosed clinically by physician as premenstrual syndrome (PMS) with regular menstruation participated in this study. They were selected randomly from outpatient clinic of obstetrics and gynecology in Abnub Hospital in Assuit. Their age ranged from 18 to 25 years old and body mass index (BMI) were less than 30 kg/m². They were assigned into two groups equal in numbers, group (A) received foot reflexology with dietary modification and group (B) received dietary modification only. Each female was informed about program of exercise and filled the informed consent form. This study was conducted from May to October 2018.

Subjects were excluded for the following criteria: Rheumatoid arthritis, Bronchial asthma, mental health problem such as depression and anxiety, women with BMI exceed 30 kg/m², patients who have migraines and chronic fatigue syndrome, skin disease interferes with foot reflexology

application and Irregular or infrequent menstrual cycle.

II-Materials

(A) Evaluation materials

- 1- **Visual analogue scale (VAS):** was used to measure the severity of pain for each female in both groups (A, B) before and after the treatment according to 5 cm calibrated line with 0(zero) representing no pain and 5 representing worst pain, each female in both groups (A&B) would be asked to mark on the line that represents her level of pain before and after treatment (Gould, 2001).
- 2- **Premenstrual daily symptoms questionnaire:** were taken for all participants in both groups (A&B) through asked all patients all questions in the questionnaire by: were you have symptoms such as: tension, anger, anxiety, depression and crying(Lori et al., 2003).

III-Methods:

A-For evaluation

- 1- History taking for both groups A, B before starting the study:
 - a. Personal history
 - b. Detailed medical history
- 2- Premenstrual daily symptoms questionnaire was used to assess premenstrual related symptoms before and after the treatment for both groups (A, B).
- 3- Visual analgesic scale was used to assess pain before and after the treatment for both groups (A, B).

B-For treatment

Group A (study group):

Patients of group (A) followed dietary modification, diet must be rich in vitamins as fish and beans, calcium

as milk and chess, low fat food through decrease oil in meals, high fiber food through all types of vegetables and fruits and restrict caffeine(Wyatt et al., 2000).With foot reflexology session which takes about 20 minutes. The position of the patient during reflexology session was a relaxed comfortable supine lying position. The therapist was sitting position at the level of the feet. The Session of reflexology was done on three points at both feet(Lynne, 2015)as follow:

1-Diaphragm reflexes:

Technique of diaphragm rocking on the foot: it was done at first through 10-20 rocks per foot by place fingers of the therapist on the top of the foot and press therapist's thumbs on the plantar and gently rock the foot backwards and forwards then repeated 3 or 4 times.

2-Brain reflexes

Technique of brain reflexes: working on big toe brain reflexes, was worked around the brain reflexes on the base and sides of the big toe by pinching gently and pressing the sides of the toe for approximately 15 seconds then repeated for 3 or 4 times.

3-Ovaries reflexes:

Technique of ovaries reflexes: working the foot ovaries reflexes, was worked up and down the ovaries reflexes with the finger or thumb move toward each other for 20 sec then repeated for 3 or 4 times.

Group B (control group):

- Patients in group (B) followed the same dietary modification as in group (A).

Statistical analysis:

- Results are expressed as mean \pm standard deviation. Test of normality, Kolmogorov-Smirnov test, was used to measure the distribution of data measured pre-treatment.
- Accordingly, comparison between normally distributed

variables in the two groups was performed using unpaired t test. Analysis of covariance (ANCOVA) test, was used to compare the post-treatment values of the two groups on controlling the effect of pre-treatment value. Bonferroni correction test was used to compare within group (pre- vs post-treatment) differences.

- In not normally distributed data, comparison between variables in the two groups was performed using Mann Whitney test. While comparison between pre- and post-treatment data in the same group was performed using Wilcoxon Sign Ranks test.
- Statistical Package for Social Sciences (SPSS) computer program (version 19 windows) was used for data analysis. P value ≤ 0.05 was considered significant.

Results

I- General characteristics of the females in both groups (A, B):

The mean values (\pm SD) of age in both groups A and B were 21.16 ± 2.23 yrs. and 20.72 ± 1.90 yrs. respectively. There was no statistical significant difference between the two groups ($t= 0.750$, $p= 0.457$). The mean values (\pm SD) of weight in both groups A and B were 64.32 ± 9.23 kg. and 63.16 ± 8.54 kg. respectively. There was no statistical significant difference between the two groups ($t= 0.461$, $p= 0.647$). The mean values (\pm SD) of height in both groups A and B were 160.88 ± 4.55 cm and 160.68 ± 4.05 cm, respectively. There was no statistical significant difference between the two groups ($t= 0.164$, $p= 0.870$). The mean values (\pm SD) of BMI in both groups A and B were 24.88 ± 3.68 kg/m² and 24.48 ± 3.40 kg/m², respectively. There was no statistical significant difference between the two groups ($t= 0.395$, $p= 0.694$).

Table(1): Physical characteristics in the both groups (A, B).

Variables	Group A (n= 25)	Group B (n= 25)	t value	P value
Age (yrs.)	21.16 \pm 2.23	20.72 \pm 1.90	0.750	0.457 (NS)
Weight (kg.)	64.32 \pm 9.23	63.16 \pm 8.54	0.461	0.647 (NS)
Height (cm)	160.88 \pm 4.55	160.68 \pm 4.05	0.164	0.870 (NS)
BMI (kg/m ²)	24.88 \pm 3.68	24.48 \pm 3.40	0.395	0.694 (NS)

Data are expressed as mean \pm SD.

NS= $p > 0.05$ = not significant.

II-Visual Analogue Scale (VAS)

Within group comparison (intra group comparison)

In group A, there was a statistical significant decrease in the median value of VAS measured at post-treatment [1.0 (0.0-1.0)] when compared with its corresponding value measured at pre-treatment [5.0 (4.0-5.0)] with Z value = -5000 and p value = 0.001 (Table, 8; Fig.13).

Also in group B, there was a statistical significant decrease in the median value of VAS measured at post-treatment [4.0 (3.0-4.0)] when compared with its corresponding value measured at pre-treatment [5.0 (4.0-5.0)] with Z value = -4.899 and p value = 0.001 (Table, 8; Fig.13).

Between groups comparison (inter group comparison)

At pre-treatment, there was no statistical significant difference between the median value of VAS in group A [5.0 (4.0-5.0)] and its corresponding value in group B [5.0 (4.0-5.0)] with Z value = -0.281 and p value = 0.779. On the other hand at post-treatment, there was a statistical significant decrease in the median value of VAS in group A [1.0 (0.0-1.0)] when compared with its corresponding value in group B [4.0 (3.0-4.0)] with Z value = -6.274 and p value = 0.001.

Table(2): Intra and inter-group comparison between median values of VAS in the two studied groups measured pre- and post-treatment.

Date of assessment	Group A (n= 25)	Group B (n= 25)	Z value	P value
Pre-treatment	5.0 (4.0-5.0)	5.0 (4.0-5.0)	-0.281	0.779 (NS)
Post-treatment	1.0 (0.0-1.0)	4.0 (3.0-4.0)	-6.274	0.001 (S)
Z ^{##} value	-5.000	-4.899		
p value	0.001 (S)	0.001 (S)		

Data are expressed as median (minimum-maximum). NS= p> 0.05= not significant.S= p< 0.05= significant.Z[#]= Mann Whitney test.Z^{##}= WilcoxonSign Ranks test.

III-Premenstrual Daily Symptoms Dairy Questionnaire

Within group comparison (intra group comparison)

In group A, there was a statistical significant decrease in the median value of PMS questionnaire measured at post-treatment [2.0 (1.0-2.0)] when compared with its corresponding value measured at pre-treatment [4.0 (3.0-4.0)] with Z value = -4.914 and p value = 0.001. Also in group B, there was a statistical significant decrease in the median value of PMS questionnaire measured at post-treatment [3.0 (2.0-4.0)] when compared with its corresponding value measured at pre-treatment [4.0 (3.0-4.0)] with Z value = -4.796 and p value = 0.001.

Between groups comparison (inter group comparison)

At pre-treatment, there was no statistical significant difference between the median value of PMS questionnaire in group A [4.0 (3.0-4.0)] and its corresponding value in group B [4.0 (3.0-4.0)] with Z value = -0.306 and p value = 0.760 (Table, 9; Fig.14).

On the other hand at post-treatment, there was a statistical significant decrease in the median value of PMS questionnaire in group A [2.0 (1.0-2.0)] when compared with its corresponding value in group B [3.0 (2.0-4.0)] with Z value = -5.086 and p value = 0.001.

Table(3): Intra and inter-group comparison between median values of PMS questionnaire in the two studied groups measured pre- and post-treatment.

Date of assessment	Group A (n= 25)	Group B (n= 25)	Z [#] value	P value
Pre-treatment	4.0 (3.0-4.0)	4.0 (3.0-4.0)	-0.306	0.760 (NS)
Post-treatment	2.0 (1.0-2.0)	3.0 (2.0-4.0)	-5.086	0.001 (S)
Z ^{##} value	-4.914	-4.796		
p value	0.001 (S)	0.001 (S)		

Data are expressed as median (minimum-maximum). NS= p> 0.05= not significant.

S= p< 0.05= significant. Z[#]= Mann Whitney test. Z^{##}= WilcoxonSign Ranks test.

Discussion

Premenstrual syndrome (PMS) is the cyclic occurrence in the luteal phase of the menstrual cycle with a combination of distressing physical, psychological and behavioral changes of sufficient severity to result in deterioration of interpersonal relationships, academic abilities and interference with normal activities which remit upon onset or immediately after menstruation (Awrence et al., 2014).

Reflexology is a special compression technique by applying pressure on reflex points on the feet and each point is responsible for a specific part of the body (Gunnarsdottir and Peden, 2010).

This study was done to investigate the effect of foot reflexology on PMS in single females. This study included 50 volunteer, single females diagnosed as premenstrual syndrome with regular menstruation were assigned into group(A) (25 single females) received therapeutic foot reflexology with dietary modification three times per

week for 8 weeks. The group (B) (25 single females) followed dietary modification as group (A) three times per week for 8 weeks.

This study showing that there was a statistical significant decrease in median value of visual analogue scale (VAS) in group A (0.0-1.0) when compared with its corresponding level in group B (3-4) with Z= -6.274 and p= 0.001 and there was a statistical significant decrease in the median value of premenstrual symptoms (PMS) questionnaire in group A (1.0-2.0) when compared with its corresponding value in group B (2.0-4.0) with Z= -5.086 and p=0.001.

The study came in agree with study by Dastegheib et al., (2013) who supported that there was significant effect of foot reflexology on PMS through study of 120 students with PMS that were divided into two groups of actual and false zone therapy. Actual group received true zone for 30min/weekly for 8 week. Based on the result, symptoms of PMS decreased which were observed in 25.26 percent of cases in actual reflex

zone therapy and 3.8 percent of cases in false reflex zone. Foot reflexology relate to improvement of blood flow, the theory that reflex points are nerve receptors whose stimulation reduced muscular or psychological tension inducing deep relaxation.

The result of study was supported by **Baghdassarians and Bagheri, (2013)** examined the effect of dietary and reflexology over PMS symptoms relief. With this study, 100 sample were selected out of IAU students and divided into 3 groups, two experimental or dietary and reflexology and one controlled groups, was carried out two months and premenstrual syndrome questionnaire was carried out on all samples through this period. Data gathering consisted of individual data questionnaire, twenty four hour diet recall questionnaire, weight management scale, foot inspection questionnaire, premenstrual syndrome questionnaire. The resulting data were analyzed and assessed with repeated measures with sphericity test producing that dietary and reflexology does affect the premenstrual syndrome symptoms relief. Due to the analgesic effect of manual pressure on reflex points of foot, this result of premenstrual syndrome symptoms relief. It confirmed that there was significant effect of dietary and reflexology on premenstrual syndrome.

This study supported by **Valizadeh et al., (2015)** who supported the effect of reflexology. Study on three-group randomized clinical trial (two experimental groups and a control group) was conducted on 69 elderly men. The two experimental

groups had reflexology (n = 23) and foot bath (n =23) interventions for 6 weeks. The reflexology intervention was done in the mornings, once a week for ten minutes on each foot. The participants in the foot bath group were asked to soak their feet in 41°C to 42°C water one hour before sleeping. The pittsburgh sleep quality index (PSQI) was completed before and after the intervention through an interview process. Results confirmed that reflexology was effective on sleep quality in elderly people due to analgesic effect of reflexology and improve blood supply of body.

In contrast, reflexology study by **Tovey, (2002)** found no evidence that the use of reflexology benefited irritable-bowel syndrome (IBS) patients. The 34 patients, who were randomly assigned to reflexology or placebo, received six 30-minute sessions over 2 months, but all were chronic sufferers who had failed previous efforts to alleviate symptoms. Map of foot reflexology represented all organs of the body and pressure on these point improve general body functions but here due to small sample size and irregular sessions, it was not effective treatment and symptoms not relief.

CONCLUSION

Foot reflexology with dietary modification is an effective non-invasive modality in the treatment of premenstrual syndrome females.

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