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Effect of aerobic exercises versus foot reflexology on post-menopausal depression

A.M. Eman[1], M.E. Mahmoud[2]

[1] Department of Women Health; [2]Department of Basic Science, Faculty of Physical therapy, Kafr el shiekh University, Cairo (Egypt)

Summary

Purpose: Aim of this study was to compare between aerobic exercise and foot reflexology effects on treatment of post-menopausal depression. *Materials and Methods:* Forty post-menopausal women complaining of mild to moderate depression selected randomly from outpatient clinic of neuropsychiatry, kafr Elsheikh hospital between March, 2015 and November 2015 were included in the study. Their age ranged from 45 to 55 years and their BMI from 25 to 35 kg/m². They had no musculoskeletal or cardiovascular disorders, free diabetes, hypertension, and no history of neurological disorders. They were divided randomly into two groups equal in number: group A treated by aerobic exercise 40 minutes, three times/ week for four weeks while group B was treated with foot reflexology for four weeks. Depression was evaluated by the Beck Depression Inventory (BDI) before and after the program for both groups. *Results:* The obtained results showed a statistically significant decrease ($p < 0.05$) in depression in both groups; when both groups were compared, a statistically expressive writing moderated the relation between intrusive thoughts. Depressive symptoms significantly decreased in in group A compared to group B ($p < 0.05$). *Conclusion:* It can be concluded that aerobic exercise and foot reflexology are effective adjacent methods in reducing post-menopausal depression, but aerobic exercise is more effective than foot reflexology.

Key words: Postmenopausal depression; Aerobic exercise; Foot reflexology.

Introduction

Menopause is the end of reproductive period in female life, and it is manifested by the permanent end of menstruation lasting at least 12 months. Menopause is not a disease, it is a normal stage in female life. Even so, the physical and psychological effect of menopause can affect woman's life, sap her energy, and disturb the female psychological state [1].

Menopausal symptoms usually begin before the one-year of last menses. They include irregular menstruation, infertility, dyspareunia due to dryness of vagina , hot flashes, sleep disturbance, disturbed mood, trunk obesity, thinning hair, and breast atrophy [2]. Menopause may increase feelings of sadness and episodes of depression in some women.

About 8% and 15% of menopausal women have some form of depression [3]. Menopausal depression may be due to abnormal change in levels of hormones in the body; during menopause, the estrogen, progesterone, and androgen levels are constantly fluctuating. These hormones drop, especially estrogen, which may be the cause of sadness in females. Females with a severe drop in mood, results in depression [4].

Depression is a mental disorder that is characterized by low mood, accompanied by low self-esteem, and loss of interest or pleasure in normally enjoyable activities. It is also called major depressive disorder, clinical depression, and major depression. Depression has adverse effects on the woman's family relationships, work, sleeping, appetite, and general condition [5].

The side-effects of noradrenergic and specific serotonergic antidepressant are drowsiness, increased appetite, and weight gain [6]. Between 30% and 50% of individuals treated with antidepressant do not show improvement [7, 8]. Aerobic exercise has been prescribed for the treatment of a variety of medical disorders as hyperlipidemia, osteoarthritis, fibromyalgia, and diabetes. In addition, exercise improves psychological state [9, 10]; it has also an improvement in a variety of psychiatric conditions, especially in depression [11]. The depressed woman with regular exercise may receive positive feedback from the others and an increased sense of self-worth. Exercise may act as a diversion from negative thoughts [12, 13].

Social contacts may be an important mechanism, and physical activity may have physiological effects such as changes in endorphins and monoamine concentrations [14, 15]. The aim of treatment by reflexology is to promote harmony of mind, body, and soul [16]. It is considered a safe, noninvasive, and inexpensive form of healthcare, used by the majority of the population especially in children, very elderly, terminally ill patients, and pregnant women [17].

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Figure 1. — Appropriate foot reflexology points for patients in group B.

Materials and Methods

Forty post-menopausal women that complaining of depression and selected randomly from outpatient clinic of neuropsychiatry, kafr Elsheikh hospital, were diagnosed by physician with mild and moderate depression. Their ages ranged from 45 to 55 years and their BMI was from 25 to 35 kg/m². They had no musculoskeletal or cardiovascular disorders, diabetes, hypertension, and no history of neurological disorders. All subjects assigned an informal consent form before beginning the study. Cairo University ethical committee approved the study (P.T.REC/01200112). The patients were divided randomly into two groups equal in number. Assessment of all subjects in both groups (A and B) was carried out before and after the treatment program via the Beck Depression Inventory (BDI-II) questionnaire [18]. It is a 21-question multiple-choice self-report inventory to assess depression state. Each answer is scored on a scale value from 0 to 3. Higher total scores indicate more severe depressive symptoms. The standardized cut-offs used differ from the original: 0–13: minimal depression,14–19: mild depression, 20–28: moderate depression, and 29–63: severe depression. Group A consisted of 20 post-menopausal women treated by aerobic exercise, in form of three sessions a week. Each session included 40-minute walking, (divided into ten minute warm-up, 20 minutes of exercise, and ten minutes of cooling down). Exercise was set at 60-70% HR max as HR max = 220 – age.

Group B consisted of 20 post-menopausal women treated by foot reflexology. In this group, all subjects were instructed briefly and clearly about the nature of treatment and its value in order to gain their confidence and co-operation throughout the study period. Each patient was advised to wear light and comfortable clothing and assume a relaxed supine laying position in a quiet room. First, whole of the sole was washed with warm water then massage protocol involved a combination of five minutes of light stroking and light pressure using the whole hand to plantar and dorsal surfaces for each foot. Reflexology intervention was applied by using a combination of finger pivot and thumb walking techniques to the base of the foot and the toes that correspond to the reflex points. The pressure was exerted on related and specified zones with special concentration on the following points: genital zone which included ovarian reflex point (1) and uterine reflex point (2) which are located at both feet under the lateral and medial malleolus, respectively; reflex point (3) represents pituitary gland, exactly in the planter aspect of the center of hallux (big toe) of both feet; solar plexus point (4) represents spleen reflex point in exterior edge of the planter aspect left foot and liver reflex point opposite of the spleen at right foot; adrenal gland reflex point (5) is located between reflex points (6) and (4). Kidney reflex point (6) is almost between width of planter aspect of four toes, under base of both feet, and in the center of the foot. In addition to breast reflex point from ankle joint, width-wise line (wrinkle) to the junction of the toes. These cones are on the basis of sole division in the center of diaphragm line, and autonomic nervous system reflex point (7) located at soles of both feet between heels and bases of the toes [19] (Figure 1). Reflexology sessions were provided for 30 minutes (each foot 15 minutes) twice a week for four weeks.

All statistical measures were performed using the Statistical Package for Social Science (SPSS) program version 18. The current test involved two independent variables. The first was the tested group which had two levels (group A and group B). The second was the training periods which had two levels (pre and post). The one dependent ordinal variable was BDI. Accordingly non-parametric tests "Wilcoxon Signed Rank tests" were used to compare between pre- and post-tests for BDI questionnaire for each group and "Mann-Whitney tests" were conducted to compare BDI questionnaire between both groups in the pre- and post-tests with an alpha level of 0.05.

Results

There was no statistical significant difference in the mean values of age (57.07 ± 4.94), weight (81.33 ± 8.63), height (160.07 ± 3.54), and BMI (31.67 ± 3.09) between group A, and group B (56.47 ± 3.78, 82.87 ± 6.27, 160.47 ± 2.03, and 32.14 ± 2.51, with t-test = 0.374, –0.557, –0.380, and –0.464; p-value = 0.600, 0.582, 0.707, and 0.647, respectively (Table 1).

Table 2 presents the comparison of the median scores of BDI questionnaire in the pre- and post-tests that were 20 and 10, respectively in the group A. Statistical analysis using the non-parametric Wilcoxon Signed Rank tests revealed that there was a significant decrease in the BDI questionnaire in the post-test in group A (Z = –4.379, p = 0.000). Meanwhile, the median score of BDI questionnaire

Table 1. — *Demographic features of the two studied groups.*

	Group A (n= 20)	Group B (n= 20)	*t*-value	*p*-value
Age (years)	57.07 ± 4.94	56.47 ± 3.78	0.374	0.600 (NS)
Weight (kg)	81.33 ± 8.63	82.87 ± 6.27	–0.557	0.582 (NS)
Height (cm)	160.07 ± 3.54	160.47 ± 2.03	–0.380	0.707 (NS)
BMI (kg/m^2)	31.67 ± 3.09	32.14 ± 2.51	–0.464	0.647 (NS)

Table 2. — *Median score, U, Z, and P values of the Beck Depression Inventory questionnaire (BDI) pre- and post-tests in both groups.*

BDI	Median score		Z-value	*p*-value
	Pre	Post		
Group A	20	10	–4.379	0.000*
Group B	21	14	–4.293	0.000*
U-value	280	62		
Z-value	–0.633	–4.912		
p-value	0.527	0.000		

in the pre- and post-tests were 21 and 14, respectively, in group B. Statistical analysis using the non-parametric Wilcoxon Signed Rank tests revealed that there was a significant decrease in the BDI questionnaire in the post-test in group B ($Z = –4.293$, $p = 0.000$).

Considering the effect of the tested group (first independent variable) on BDI questionnaire, Mann-Whitney tests revealed that the median score of the pre-test between both groups revealed that there was no significant difference between both groups ($U = 280$, $Z = –0.633$, and $p = 0.929$), while the median score of the post-test between both groups showed a significant reduction in BDI questionnaire in favor of group A ($U = 0.62$, $Z = –4.912$, and $p = 0.000$*) (Table 2).

Discussion

Menopause always occurs during women's midlife, during their late 40s or early 50s, and signals the end of the fertile phase. The functional disorders often significantly speed up the menopausal process and create more significant health problems, both physical and emotional, for the affected woman [20]. Common menopausal symptoms include menstrual irregularities, hot flash, night sweats, mood swing, headache, insomnia, vaginal dryness, urinary problems, weight gain, memory and cognitive change, and fatigue. The dangerous symptoms are heavy bleeding, heart palpitation, depression, and high blood pressure [21].

The interaction of physical fitness and mental well-being has been increasingly recognized in psychiatry. In the meanwhile, solid evidence has emerged that regular exercise is associated with therapeutic effects in depressive patient and other psychiatric disorders [22]. Sufficient evidence now exists for the effectiveness of exercise in the treatment of clinical depression. Additionally, exercise has a moderate reducing effect on state and trait anxiety and can improve physical self-perceptions, and in some cases global self-esteem. Also there is now good evidence that aerobic and resistance exercise enhances mood states, and weaker evidence that exercise can improve cognitive function (primarily assessed by reaction time) in older adults [23]. The results of the present study agree with Conn who stated that exercise is an effective non-pharmacological therapy to reduce depressive symptoms among those living with depression, with a moderate standardized mean reduction when compared to those who do not exercise [24]. Elshamy *et al.* concluded that aerobic exercise with antidepressive drug produced substantial improvement in mood of post- menopausal women with major depressive disorders than antidepressants alone [25] .

Castren also agreed with the present results as he found that physical activity and exercise help depressed patients and promoted quicker and better relief from depression [26]. Aerobic exercises help antidepressants and psychotherapy work better and many find that walking, for example, is of great help; the reasons for improvement in this study may be related to the fact that exercise produces higher levels of chemicals in the brain, such as dopamine, serotonin, and norepinephrine. In general this leads to improvements in mood and sleep disturbance, which is effective in countering depression [27].

Reflexology has been used as an alternative or complementary therapy to relieve stress and tension, improve the blood supply, and promote homeostasis [28]. Another possible theory to be taken into account in the effect of reflexology is a specific form of foot massage in which it is believed that areas in the feet and hands correspond to the glands, organs, and other parts of the body [29]. Also, reflexology produces a relaxing effect by relieving tension and stress related to physical problems. This relaxation affects the autonomic response, which, in turn, affects the endocrine, immune, and neuropeptide systems [30]. The finding of the present study agree with Nancy *et al.* who stated that reflexology can be used to decrease anxiety and pain in patients with cancer [31]. These results were supported by Rapaport *et al.* who also stated that mood disorders had been reduced by relaxation training in patients suffering from depressive disorders [32]. The results also agree with Ahn 2006 who stated that foot reflexology is effective in relieving of pain and depression [33]. Finally, the psychological explanation states that reflexology is simply a method of showing care and concern for patients. It has a positive effect on well-being and quality of life, stress, anxiety, and pain [34].

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Corresponding Author:
M.E. EMAN, M.D.
Department of Women Health
Faculty of Physical Therapy
Kafr el shiekh University
Cairo (Egypt)
e-mail: Emanabdelfatah123@yahoo.com