

The effect of relaxation techniques on hypertension secondary to menopause

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Context

Hypertension after menopause sets women up for an increased risk of negative cardiovascular outcomes. A variety of relaxation techniques exist, which aim to relieve stress and reduce blood pressure. Several studies have been conducted to demonstrate the role of several relaxation techniques in lowering the blood pressure in hypertensive patients.

Aim

The aim of this study was to determine the effect of relaxation techniques on postmenopausal hypertension.

Participants and methods

Forty postmenopausal hypertensive women were selected randomly from the outpatient clinic at El Agouza Hospital. They were divided randomly into two groups (A, B): group A was treated with antihypertensive drugs (captopril 25 mg twice daily) and relaxation technique sessions (each session 20 min, three times per week for 3 months), whereas group B was treated with antihypertensive drugs (captopril 25 mg twice daily) only. Blood pressure was evaluated before and after performing the program for both groups. Variables were compared using the unpaired *t*-test, whereas pairwise comparison (pretreatment vs. post-treatment) within the same group was performed using paired *t*-test.

Results

Group A, which was treated with antihypertensive drugs and relaxation techniques, showed a statistically highly significant difference ($P < 0.01$) in both diastolic blood pressure and systolic blood pressure compared with group B, as the mean difference was 12.5 and 3.5, respectively, in the diastolic blood pressure of groups A and B and 15.25 and 6.75 in the systolic blood pressure in groups A and B before and after performing the program, respectively.

Conclusion

The practice of relaxation techniques was a very effective method in reducing blood pressure in postmenopausal women.

Keywords:

hypertension, menopause, relaxation techniques

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Introduction

Hypertension is a major health problem in Egypt, with a prevalence of 26.3% [1].

Increased blood pressure after menopause sets women up for an increased risk of negative cardiovascular outcomes [2].

A variety of relaxation techniques exist, which aim to relieve stress and reduce blood pressure [3].

Meditation is defined as a stylized mental relaxation technique repetitively practiced for the purpose of attaining a subjective experience that is frequently described as very restful, silent, and of heightened alertness [4].

Therefore, this study was conducted to determine the effect of relaxation techniques on hypertensive postmenopausal women.

Participants and methods

Participants

This study was carried out on 40 postmenopausal hypertensive women. They were selected randomly from the outpatient clinic at El Agouza Hospital, and their blood pressure ranged from 140/90 to 180/

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110 mmHg. The study was conducted from May 2014 to November 2014. The protocol was approved by the ethical committee of Cairo University and an informed consent was obtained.

Inclusive criteria

- (1) All women were postmenopausal since at least 1 year.
- (2) Their ages ranged from 50 to 65 years.
- (3) All women had BMI below 30 kg/m².
- (4) All women had essential hypertension (without cause).

Exclusion criteria include women with tumor or secondary hypertension.

An informed consent form had been signed by each woman before participating in the study. The purpose and nature of the study was explained to all women.

The participants were divided randomly into two groups in equal numbers:

Group A

Twenty women received relaxation techniques combined with antihypertensive drugs (captopril 25 mg twice daily).

Group B

Twenty women received antihypertensive drugs only (captopril 25 mg twice daily).

Evaluative procedures

Before starting the study, each woman was subjected to careful history taking, including personal history (name, age, address, telephone number, occupation, marital state), family history of hypertension, and height and weight were recorded.

Measurement procedures

Blood pressure measurement

The procedure was carefully and clearly explained to each woman, to actively motivate her to perform maximally. The women were advised to avoid salty and spicy food and to avoid drinking tea, coffee, smoking, and alcohol before measurement sessions. Blood pressure was measured in millimeter of mercury by a sphygmomanometer three times at the beginning, at the middle, and at the end of the program, and then the mean of summation of three reading was recorded.

Training procedure

All women had full illustration as well as explanation about the protocol of the study and signed a written approved consent form before the study.

Duration of the session: 20 min.

Frequency: Three times per week for 3 months.

Position of the woman: Half lying position, with back supported, both arms are relaxed at the sides.

Techniques applied

The woman was asked to bring her attention to her breathing, notice if it is shallow breathing, or short and quick breaths. Then, begin to picture an object in her mind. This object should be simple and pleasurable to her. It could be the sky, the moon, etc. Some people prefer a favorite sound, such as music. Whichever they choose, try to visualize the object, word, or something to represent the sound.

- (1) Then the woman was asked to close her eyes and take a deep breath from her nose and fill her abdomen like balloon fully and slowly to the count of 4 till her abdomen was full, then expire the air from her mouth, and then contract her abdomen in.
- (2) If there was any interruption, she was asked to bring her attention back to her breathing as distractions are normal.
- (3) This procedure was repeated four times: deep breaths to a count of 4 and expired at a count of 4.
- (4) Then, the woman was asked to take a four-count deep breath, hold it to a count of 4, and expire at a count of 4.
- (5) She was asked to imagine being somewhere she felt more relaxed. A beach in the summer or the river where she could sit and watch the beautiful scene, and hear the soothing sound of the running water.
- (6) Then, the woman was asked to give herself affirmations such as: I am calm and collected. In this technique, a combination of breathing exercises and transcendental meditation (TM) were used.

Statistical analysis

Results are expressed as mean±SD. The mean difference in both diastolic blood pressure (DBP) and systolic blood pressure (SBP) is calculated from the equation: pretreatment–post-treatment. Comparison between variables in the two studied groups was performed using the unpaired t-test, whereas a pairwise comparison (pretreatment vs. post-treatment) within the same group was performed using the paired t-test. The statistical package for social sciences (SPSS) computer program (version 19 for Windows) was used for data analysis. P value of 0.05 or less was considered significant and less than 0.01 was considered highly significant.

Results

Table 1 represents the general characteristics of the two groups (A, B) at entry into the study and shows that there was no statistically significant difference between the mean value of age, weight, height, and BMI of study group (group A) and control group (group B).

Comparison between mean values of DBP measured before and after treatment in both groups (A, B) (within group comparison) were made using a paired *t*-test between the values obtained at entry into the study and after the end of the treatment program, which showed a statistically highly significant decrease ($P=0.001$) in DBP in both groups, with *t*-value of 8.238 and 4.273, respectively, as shown in Table 2.

Comparison between mean values of SBP measured before and after treatment in both groups (A, B) was made using the paired *t*-test between values obtained at entry into the study and after the end of the treatment program, which showed a statistically highly significant decrease ($P=0.001$) in SBP in both groups, with *t*-values of 8.677 and 6.110, respectively, as shown in Table 3.

Before treatment, there was no statistically significant difference between the mean value of DBP of the study group (group A) (98.50 ± 8.13) and its corresponding value in the control group (group B) (99.25 ± 7.66), with a *t*-test value of -0.300 and a *P* value of 0.766 (Table 4).

Table 1 General characteristics of both groups (A, B)

	Study group (group A) (n=20)	Control group (group B) (n=20)	<i>t</i> -Value	<i>P</i> value
Age (years)	53.45±3.24	54.50±3.36	-1.006	0.321 (NS)
Weight (kg)	79.80±5.45	80.90±6.66	-0.571	0.571 (NS)
Height (cm)	166.35±3.94	168.25±5.50	-1.257	0.216 (NS)
BMI (kg/m ²)	28.70±0.94	28.33±1.03	1.188	0.242 (NS)

Data are expressed as mean±SD. $P>0.05$, NS.

Table 2 Comparison between mean values of diastolic blood pressure measured before and after treatment in both groups (A, B)

	Study group (group A) (n=20)	Control group (group B) (n=20)
Pretreatment	98.50±8.13	99.25±7.66
Post-treatment	86.00±6.81	95.75±7.66
Mean difference	12.5	3.50
Percentage of improvement	12.69	3.53
<i>t</i> -Value	8.238	4.273
<i>P</i> value	0.001**	0.001**

Data are expressed as mean±SD. $P<0.01$, highly significant. **Highly significant.

However, there was a statistically highly significant increase in the mean value of difference in DBP in the study group (group A) (12.50 ± 6.79) when compared with its corresponding value in the control group (group B) (3.50 ± 3.66), with a *t*-test of 5.219 and a *P* value of 0.001 (Table 5).

Comparison between mean values of before treatment and difference in SBP in both groups (A, B) showed that before treatment, there was no statistically significant difference between the mean value of SBP of the study group (group A) (165.75 ± 14.07) and its corresponding value in the control group (group B) (160.75 ± 12.70), with a *t*-test of 1.180 and a *P* value of 0.245. However, there was a statistically highly significant increase in the mean value of difference in SBP in the study group (group A) (15.25 ± 7.86) when compared with its corresponding value in the control group (group B) (6.75 ± 4.94), with a *t*-test of 4.095 and a *P* value of 0.001 (Table 4).

Discussion

Hypertension is a major health problem in Egypt with a prevalence rate of 26.3% among the adult population. Its prevalence increases with aging: ~50% of Egyptians above the age of 60 years suffer from hypertension [1].

Table 3 Comparison between mean values of systolic blood pressure measured before and after treatment in both groups (A, B)

	Study group (group A) (n=20)	Control group (group B) (n=20)
Pretreatment	165.75±14.07	160.75±12.70
Post-treatment	150.50±11.69	154.0±12.94
Mean difference	15.25	6.75
Percentage of improvement	9.20	4.2
<i>t</i> -Value	8.677	6.110
<i>P</i> value	0.001**	0.001**

Data are expressed as mean±SD. $P<0.01$, highly significant. **Highly significant.

Table 4 Comparison between mean values of pretreatment values and difference in systolic blood pressure in both groups (A, B)

	Study group (group A) (n=20)	Control group (group B) (n=20)	<i>t</i> - Value	<i>P</i> value
Pretreatment	165.75±14.07	160.75±12.70	1.180	0.245 (NS)
Mean difference	15.25±7.86	6.75±4.94	4.095	0.001**

Data are expressed as mean±SD. $P>0.05$, NS. $P<0.01$, highly significant. **Highly significant.

Table 5 Comparison between mean values of pretreatment values and difference in diastolic blood pressure in both groups (A, B)

	Study group (group A) (n=20)	Control group (group B) (n=20)	t-Value	P value
Pretreatment	98.50±8.13	99.25±7.66	-0.300	0.766 (NS)
Mean difference	12.50±6.79	3.50±3.66	5.219	0.001**

Data are expressed as mean±SD. $P>0.05$, NS. $P<0.01$, highly significant. **Highly significant.

The increase in blood pressure after menopause sets women up for an increased risk of negative cardiovascular outcomes [2].

A variety of relaxation techniques exist, which aim to relieve stress and tension, reduce blood pressure, and improve feelings of control over our lives [3].

Several studies have been conducted to demonstrate the role of several relaxation techniques in lowering the blood pressure in hypertensive patients.

Meditation (which is one of the relaxation techniques) is defined as a stylized mental technique repetitively practiced for the purpose of attaining a subjective experience that is frequently described as very restful, silent, and of heightened alertness, often characterized as blissful [4].

Therefore, this study was conducted to determine the effect of relaxation techniques, which included meditation on hypertensive postmenopausal women. It was believed that the findings of this study could provide additional information to those who work in the field of management of postmenopausal hypertension.

Forty postmenopausal hypertensive women were selected randomly from the outpatient clinic at El Agouza Hospital. Their age ranged from 50 to 65 years, their BMI levels were below 30 kg/m², and their blood pressure ranged from 140/90 to 180/110 mmHg. They were divided randomly into two groups equal in number: group A treated with antihypertensive drugs (captopril 25 mg twice daily) and relaxation techniques (each session of about 20 min, applied three times per week, for 3 months) and group B treated with antihypertensive drugs (captopril 25 mg twice daily) only.

This study was conducted to investigate the effect of relaxation techniques (which include meditation and breathing exercises) on postmenopausal hypertension.

The result of this study revealed that there was statistically highly significant decrease ($P<0.01$) in the blood pressure in both groups (A, B), but when the mean

difference between the two groups (A, B) was compared, it was found that group A, treated with antihypertensive drugs and relaxation techniques, showed a statistically highly significantly greater difference ($P<0.01$) in both DBP and SBP compared with group B, which was treated with antihypertensive drugs only.

The results of this study agreed with those of Mohamed *et al.* [5], who examined the effect of slow deep-breathing exercise on blood pressure and heart rate on newly diagnosed patients with essential hypertension and found that there was a highly statistically significant difference in SBP and DBP as well as in the heart rate after intervention.

The results of the current study are also supported by Ray *et al.* [6], who stated that there were beneficial effects of meditation on various cardiovascular risk factors such as hypertension, type 2 diabetes, and dyslipidemia.

The results of this study agreed with those of Schneider *et al.* [7] who studied 201 participants divided randomly into a TM group ($n=99$) and a control group ($n=102$): TM technique was practiced 20 min twice a day while sitting comfortably with eyes closed. Participants were assessed at baseline, at month 3, and every 6 months; they reported that the TM group had a significant effect on reducing the risk for mortality, myocardial infarction, and stroke in coronary heart disease patients compared with the control group. These changes were associated with a lower blood pressure and psychosocial stress factors. Therefore, this practice may be clinically useful in the secondary prevention of cardiovascular disease.

The results of this study agreed with those of Mourya *et al.* [8], who studied the effect of breathing exercises practiced in various forms (slow-breathing and fast-breathing) on 60 patients aged 20–60 years with stage 1 essential hypertension: they were divided equally into the control group and two intervention groups, who were advised to practice 3 months of slow-breathing and fast-breathing exercises, respectively. They found that the blood pressure decreased longitudinally over a 3-month period with both interventions (slow-breathing and fast-breathing), but slow breathing had a stronger effect than fast breathing on blood pressure reduction.

The results of the current study are supported by Nidich *et al.* [9], who found that after 3 months of practicing TM program, there was a SBP and DBP reduction associated with decreased psychological distress in the study group compared with the control group. Also, there were significant improvements in total psychological distress, anxiety, depression, anger/hostility, and coping ($P < 0.05$). Changes in psychological distress and coping correlated with changes in SBP (where $P < 0.05$) and DBP (where $P < 0.08$). Thus, the TM program may reduce the risk for future development of hypertension in young adults.

In contrast, the results of this study disagreed with those of Cramer *et al.* [10], who studied the quality of evidence and the strength of recommendation of yoga program (as a modality of relaxation techniques) practiced for 8 weeks as a therapeutic means in the management of prehypertension and hypertension; they reported that no evidence was found for effects of yoga (as a modality of relaxation techniques) on SBP or DBP. Larger studies are required to confirm the emerging but low-quality evidence that yoga may be a useful adjunct intervention in the management of hypertension.

Also, the results of this study disagreed with those of Parati *et al.* [11], who investigated the effect of TM on blood pressure; their conclusions did not appear to provide a final answer as to whether TM can be regarded as an effective nonpharmacological approach for blood pressure reduction in hypertension. Hence, they reported that there is no sufficient good-quality evidence to firmly establish whether or not TM has a positive effect on blood pressure [12].

Conclusion

Hypertension is one of the most prevalent and powerful contributors to atherosclerotic cardiovascular disease. Cardiovascular disease is the leading cause of morbidity and mortality in postmenopausal women.

A variety of relaxation techniques exist, which aim to relieve stress and reduce blood pressure.

Meditation is defined as a stylized mental relaxation technique repetitively practiced for the purpose of attaining a subjective experience that is frequently described as very restful, silent, and of heightened alertness.

Our study was conducted to determine the effect of relaxation techniques on hypertensive postmenopausal

women and found that the practice of relaxation techniques was a very effective method in reducing blood pressure in postmenopausal women.

Recommendations

- (1) Further researches are needed to determine the effect of relaxation techniques in the treatment and prevention of different postmenopausal symptoms.
- (2) Further researches are needed to study the effect of relaxation techniques on hypertension after menopause on a large sample and over a longer period.
- (3) Women must be advised to practice relaxation techniques as a daily home routine, especially after menopause.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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