

REVIEW ΑΝΑΣΚΟΠΗΣΗ

Exercise in menopausal years

Menopause is characterized by physiologic and psychosocial changes in a woman's life. It is important to develop interventions to alleviate symptoms in women during this phase of life. The problems arising due to the hypo-estrogenic status should be managed by planning a good health program strategy, involving lifestyle modifications and exercise. Exercise may be useful and have beneficial effects on muscle function, anthropometric, somatic, and psychological menopause symptoms. Basic types of therapeutic exercise regarding menopause symptoms include aerobic, resistance and neuromotor training. Literature suggests that regular physical activity and exercise might significantly reduce menopausal symptoms, and improve general well-being and health status.

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2025, 42(3):295–301

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Η άσκηση στα χρόνια
της εμμηνόπαυσης

Περίληψη στο τέλος του άρθρου

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1. INTRODUCTION

Menopause, from the Greek word *men-* (month) and *pausis* (cessation), is defined as the end of the woman's fertile life¹ and is caused by reduced secretion of the ovarian hormones estrogen and progesterone.² Menopause typically occurs between the ages of 45 and 55 years and is due to the cessation of estrogen production due to stimulation by the follicle-stimulating and luteinizing hormones as a result of ovarian follicular atresia.^{1,2} The menopausal transition (climacteric phase of life) is not sudden and occurs over several years.¹ This period includes elevation of the serum follicle-stimulating hormone (FSH) concentration and a decline in the estradiol concentration, both of which exhibit wide interindividual variation.^{3,4}

The symptoms during the climacteric syndrome are highly varied⁵ and may be disruptive to overall quality of life. The most common of these symptoms are vasomotor (e.g. hot flashes), atrophic (e.g. urogenital problems, bladder

irritability), psychological (e.g. sleep and mood disorders, depression, anxiety), cognitive and memory-related.^{1,5,6} Common symptoms are also fatigue, decreased libido and sexual problems, back pain, etc.^{1,7} Many women experience weight gain and an increase in abdominal fat. This increase in abdominal fat deposition is linked to the decrease in estrogen, which signals fat to be stored in the hips and thighs. A large number of studies have documented the negative impact of menopause on quality of life (QoL).^{8–10}

In addition, these hormonal changes may increase the risk for various chronic diseases such as diabetes, cancer and cardiovascular problems.¹ In addition to these problems, the reduction in estrogen can cause bone mass loss, resulting in osteoporosis, and sarcopenia, the prevalence of which increases with the woman's age.^{2,11} Furthermore, an earlier age of menopause onset is related to greater frailty in later life.¹²

The number of women aged 45 and above has been

steadily increasing and will continue to rise.¹² Symptoms of menopause can be severe for many women and it seems important to improve the level of knowledge to health professionals and women regarding menopause and health care.^{13,14} In order to understand and to promote women's health and well-being during aging, the role of the menopausal transition on health determinants that go beyond the reproductive functions and organs need to be investigated and acknowledged.^{1,2}

It has been shown that the use of hormone therapy alleviates menopausal symptoms. Hormone replacement therapy (HRT) is supplementing women with hormones that are lost during the menopausal transition. HRT includes an estrogen and progesterone component to mimic hormones created by the human ovary.¹⁵ Hormone therapy is an effective treatment for symptoms during menopause (including vasomotor symptoms and genitourinary syndrome); however, many women seek other treatment with fewer adverse effects and health risks than those associated with HT.¹⁵ Evidence needs to be accumulated regarding possible lifestyle modification interventions that alleviate menopausal symptoms. The treatment for menopausal transition should be primarily decided according to the frequency and severity of the symptoms of menopause.^{15,16}

Many women are searching for different, alternative methods to reduce the severity of menopausal symptoms. Physical activity (PA) is one of the recommended methods to reduce menopausal symptoms.¹⁷ Exercise is an inexpensive intervention that has many significant health benefits.¹⁸ Research indicates that postmenopausal women who engage in the comprehensive exercise program, benefit by maintaining a healthy body, bone density levels, and good mental health.^{7,18}

Thus, the aim of this review is to provide evidence-based recommendations for health care professionals concerning the quantity and quality of exercise prescriptions for women in menopause.

2. BENEFITS OF EXERCISE

Not all women have the same symptoms, fitness levels, or health concerns.¹ The health professional should assess the woman and the exercise programme should be individualized according to a woman's personal medical and physical activity history and goals. Therapeutic exercise is beneficial for various conditions and may help women during menopause.^{7,17} The main benefits of therapeutic exercise during menopausal years are presented in table 1.

Table 1. Benefits of exercise during menopause.

Increases the cardiorespiratory function
Increases HDL, reduces LDL, triglycerides and fibrinogen
Decreases insulin resistance
Reduces high blood pressure
Increases the bone mass and reduces bone loss
Reduces low back pain
Reduces stress and anxiety
Help to reduce hot flashes
Reduces weight gain and muscle loss
Decreases visceral fat
Strengthens pelvic floor muscles
Improves motor control and muscle coordination
Improves sleep
Improves physical abilities
Increases quality of life

2.1. Benefits on weight

According to the Centers for Disease Control and Prevention, regular exercise helps relieve stress, enhances overall quality of life, and reduces weight gain and muscle loss, the most frequent side effects of menopause.¹ Women who are physically active after menopause can maintain lower body weight and sufficient lean muscle mass. Although most women gain weight during postmenopause, body weight changes are attenuated in women who achieve sufficient levels of physical activity.¹⁹

In addition, as women enter menopause abdominal fat increases. Evidence shows that exercise promotes visceral fat loss, thus reducing cardiometabolic disease.¹⁷

2.2. Benefits on mental health

Physical activity and exercise during menopause are efficient in improving the mood and mental and psychological health of women population.^{20,21} In cross-sectional studies, more physically active women report less nervousness, fewer menopausal symptoms, and fewer depressive symptoms.^{21,22}

Regarding depression, there is a positive effect of exercise interventions with low to moderate intensity, including aerobic exercise and yoga.^{22,23} Exercise as a low cost and non-invasive therapy promotes well-being and enhancing mood. Aerobics is an emerging training programme that integrates gymnastics, dance and music. Existing research suggests that women's participation in mass aerobics may

help them maintain a positive and optimistic mood and may interfere with depression and anxiety. Aerobic exercise can be used as an intervention to improve the mental health level of perimenopausal women in terms of anxiety, depression and sleep quality in clinical promotion.²⁴

Obesity and estrogen deprivation have been identified as significant risk factors for cognitive impairment. Thus, postmenopausal conditions when paired with obesity may further amplify the risks of cognitive impairment.²⁵ Physical exercise has been recommended as a primary treatment for preventing obesity-related comorbidities and alleviating menopausal symptoms.²⁶ Possible mechanisms by which physical exercise-induced cognitive improvement could be mainly due to (a) the upregulation of neurotrophic factors, (b) the reduction of insulin resistance, (c) the reduction of pro-inflammatory cytokines, and (d) the increment of anti-inflammatory markers.^{17,25,26}

2.3. Benefits on vasomotor symptoms

Observational studies have reported inconsistent findings regarding the association between exercise and lower rates of vasomotor symptoms, although larger studies have tended to report positive associations, and smaller studies negative or no associations. Exercise may decrease vasomotor symptoms by increasing hypothalamic and peripheral β -endorphin production. Through these mechanisms, exercise may help to stabilize the thermoregulatory center and diminish the risk of hot flashes.²⁷

Exercise and physical activity could “distract” women from attention to their hot flashes by habituating them to the feelings of increased heat and heat dissipation through sweating that accompanies increases in physical effort and associating those feelings with behaviors that may make them feel good in other ways. On the other hand, exercise raises core temperature, and may actually induce hot flashes, particularly if symptomatic women have a narrowed thermoregulatory zone.^{28,29} However, evidence seems insufficient to show whether exercise is an effective treatment for vasomotor menopausal symptoms. Future trials should measure and report this issue in greater detail.

2.4. Benefits on bone density

The evidence for increased bone mineral density (BMD) in response to exercise training and or physical activity comes from a large number of studies.^{30–33} Exercise and physical activity mitigate menopause transition related BMD decline. Varied forms of moderate-to-high intensity exercise interventions result in BMD gains in premenopausal

women and lessen BMD loss in postmenopausal women.³⁰

The profound declines in BMD, corresponding with high bone resorption, occur two to three years prior to the final menstrual period, during which FSH levels increase while estrogen levels remain relatively stable.^{30,34} In the following years, the loss is less rapid as it is the immediate postmenopausal period characterized by a greater speed and entity of bone loss.^{35,36} These facts highlight the need to create therapeutic exercise programmes even before the last menstrual period and postmenopause. Various exercises have been described to stimulate bone growth and preserve the bone mass; the optimal interventions are those favoring a mechanical stimulus on bone both through antigravity loading and the stress exerted on muscles.³⁶

2.5. Benefits on cardiometabolic diseases

Regular exercise is recommended by the American College of Cardiology/American Heart Association (ACC/AHA) guideline for the primary prevention of cardiovascular disease. The lack of estrogen to support cardiovascular health and inactivity in postmenopausal women is associated with several cardiovascular risk factors, such as obesity, metabolic syndrome, hypertension, and dyslipidemia which predispose women to increased incidence of cardiovascular disease. Regular physical activity and weight loss can improve the risk factors that contribute to heart disease in women.¹⁷ Regular physical exercise can either prevent or improve preexisting hypertension through weight reduction and peripheral vasodilatation through improvement in endothelial dysfunction, release of nitric oxide (NO), and cyclic guanosine monophosphate (cGMP), as well as through improvement of oxidative stress.³⁷

2.6. Benefits on sleep

Sleep disturbances are associated with the menopausal transition and exercise intervention has been associated with a significant decrease in the severity of insomnia and alleviates sleep problems. The mechanism underlying the effectiveness of exercise on sleep outcomes includes thermoregulation, cytokine elevation, endorphin release and neurochemical changes.^{38,39} Exercise also reverses the sleep deprivation-induced decreased release of growth hormone.³⁸ The benefits of exercise intervention for sleep problems have been confirmed in different populations.³⁸ Further studies applying different types of exercise (e.g., walking, yoga, meditative exercise and so on) with different intervention durations as well as subjective and objective sleep assessment should be performed on exercise inter-

vention for sleep improvement in order to provide more sound clinical recommendations.³⁸

3. PRESCRIPTION OF EXERCISE DURING MENOPAUSE

The Royal College of Obstetricians and Gynaecologists in the United Kingdom has advised that women who are more active tend to suffer less from the symptoms of menopause, and that the best type of activity is aerobic, sustained, regular exercise such as swimming and running. The exercise programme for postmenopausal women should include endurance (aerobic), strength, and balance exercise. Out of these aerobics, weight bearing and resistance exercises are all effective in increasing the bone mineral density of the spine in postmenopausal women.^{27,35,39,40}

3.1. Strength exercises

Strength exercises can be beneficial for improving strength, physical activity, bone density and hormonal and metabolic levels. In terms of the appropriate type of strength training, the evidence is still unclear given that the same benefits are achieved by various types of exercises. As part of a comprehensive exercise program, American College of Sports Medicine (ACSM)^{41,42} and the Physical Activity Guidelines for Americans⁴³ recommend exercising each major muscle group 2 to 3 days per week with 2 to 4 sets of 8 to 12 repetitions as most effective, although one set of 8 to 12 repetitions can improve strength, particularly in novice exercisers and those who are deconditioned.¹⁷

It is also possible that the relationship between exercise and menopausal symptoms is mediated by exercise intensity, as it has been suggested that the production of β -endorphins is more likely to occur during high-intensity rather than low-intensity exercise.⁴⁴

Resistance exercise is particularly important when considering the maintenance and building of BMD.^{5,45} *Strength and resistance exercises* are carried out with loading (lifting weights) or without (swimming, cycling).³⁶ An effective exercise prescription may be performed three days a week (on alternate days). Weight bearing exercises, lifting weights, using elastic bands or weight machines for exercise, using simple functional movements such as standing or lifting the own body weight could be useful.^{7,42}

In addition, core stability exercises may be useful because they have the ability to reduce pain, disability and to improve strength and QoL.^{4,26} The transversus abdominus, diaphragm, multifidus, and pelvic floor muscles are among the muscles that make up the “core”.

An important group of muscles that should be trained regularly as a woman begins perimenopause and continues into older age is the pelvic floor muscles.¹⁷ Kegel exercises simply involve isometric contraction (squeezing) of the muscles of the pelvis. The trained physiotherapist encourages the woman to perform pelvic floor exercises at home one or more times a day, gradually increasing the intensity and length of contractions. Most women get informed during the postmenopausal period, which is very late. Improving common knowledge about pelvic floor training is beneficial and could help for prevention.⁴⁸

3.2. Cardiorespiratory exercises

Several observational studies indicate an association between aerobic training and menopausal symptoms.^{49–51} It has been shown that physical activity helps reduce depression, night sweats and irritability.⁴⁶ In addition, weight bearing aerobic exercise (e.g., tennis, stair climbing) seems to be particularly effective in the enzymatic activation of the osteoblasts.³⁶

Consistent with the recommendations of ACSM^{41,52} and the Physical Activity Guidelines for Americans,⁵³ women seeking to improve their health and well-being should aim to achieve 5 days or more per week of 30 to 60 minutes of moderate-intensity physical activity or 3 days or more per week of 20 to 30 minutes of vigorous activities, or a combination of moderate and vigorous activity.

Women going through the menopausal transition and postmenopausal women vary widely in age, lifestyles, and health status. Thus, when selecting a mode and intensity for aerobic exercise, consider current physical activity levels, health status, previous exercise history, physical capabilities, and feasibility (i.e., access, cost, skill level, and goals). The key is to start slowly and do things one enjoys such as walking, cycling, vigorous yard work, swimming, cardio machines or attending group fitness classes. The activity should be fast enough to get the heart pumping without being out of breath or exhausted.⁷

3.3. Flexibility exercises

These results suggest that stretching can be safely and frequently practiced by middle-aged women and is likely to improve menopausal and depressive symptoms.⁵⁴ The stretching performed before bedtime may have improved the participants' sleep, leading to positive effects on menopausal and depressive symptoms. Acute stretching suppresses sympathetic nervous activity and increases parasympathetic activity,⁵⁵ which seems to be effective for achieving better sleep.⁵⁶

3.4. Neuromotor exercises

In addition to a range of physiological and psychological symptoms, menopause causes a decrement in balance performance and risk of falls. Changes in balance performance are likely the result of complex interaction of somatic and psychological.⁵⁷ Resistance and balance training and whole-body vibration exercises may help to improve balance and gait. In addition, core stabilization exercises have proven to be more effective than for improving physical performance, static and dynamic balance in post-menopausal women.⁵⁸

4. CONCLUSIONS

Therapeutic exercise is an effective method for prevention of cardiometabolic risks, obesity-related problems, as well as menopausal-related symptoms such as depression, anxiety symptoms, and sarcopenia. It is necessary for health professionals to be aware of the woman's medical condition prior to exercise.¹⁷ This review could aid health professionals in the prescription of physical exercise as a therapeutic approach for various symptoms in menopause. In conclusion, more randomized clinical trials and specific exercise protocols for menopausal women should be developed.

ΠΕΡΙΛΗΨΗ

Η άσκηση στα χρόνια της εμμηνόπαυσης

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Η εμμηνόπαυση χαρακτηρίζεται από φυσιολογικές και ψυχολογικές αλλαγές στη ζωή της γυναίκας. Κρίνεται σημαντική η δημιουργία παρεμβάσεων ώστε να μειωθούν τα συμπτώματα σε αυτή την περίοδο της ζωής των γυναικών. Τα προβλήματα που δημιουργούνται από την έλλειψη οιστρογόνων πρέπει να αντιμετωπιστούν με σχεδιασμό καλών προγραμμάτων υγείας, περιλαμβάνοντας αλλαγές στον τρόπο ζωής και άσκηση. Η άσκηση πρέπει να είναι χρήσιμη, με οφέλη στη μυϊκή λειτουργία, σε ανθρωπομετρικά, σωματικά και ψυχολογικά συμπτώματα. Οι βασικοί τύποι της θεραπευτικής άσκησης σε σχέση με τα συμπτώματα της εμμηνόπαυσης είναι η αεροβική άσκηση, οι ασκήσεις αντιστάσεων και νευρομυϊκού ελέγχου. Μέσα από τη βιβλιογραφία προτείνεται ότι η συστηματική φυσική δραστηριότητα και άσκηση θα μειώσουν τα συμπτώματα της εμμηνόπαυσης, θα προκαλέσουν ευεξία και θα βελτιώσουν το επίπεδο υγείας.

Λέξεις ευρητηρίου: Αεροβική, Αντιστάσεις, Άσκηση, Εμμηνόπαυση

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