



Review

To exercise, or, not to exercise, during menopause and beyond

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ABSTRACT

Menopausal symptoms in women can be severe and disruptive to overall quality of life. Hormone replacement therapy, is known to be effective in ameliorating symptoms, however, reporting of side effects has resulted in alternative treatment options. Exercise has been assessed as an alternative treatment option for alleviating menopausal symptoms, including, psychological, vasomotor, somatic and sexual symptoms. Here we report the effects of physical activity and exercise on menopause symptoms in menopausal women.

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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 life, following loss of ovarian follicular function, usually occurring in the late 40s to early 50s. The transition is not sudden or abrupt and occurs over several years (5–8 years), and is commonly referred to as, change of

life or the climacteric. During the transition, a number of signs and symptoms may occur, including, vasomotor symptoms (hot flashes, palpitations), psychological symptoms (mood changes, depression, irritability, anxiety, sleep disturbances), cognitive symptoms (memory problems, concentration) and, atrophic effects (atrophic vaginitis, bladder irritability) [1–4]. Women also report symptoms including night sweats, headaches, fatigue, decreased libido, severe itching, and back and muscle pains [5]. Such symptoms can significantly disrupt a woman's daily activities and overall quality of life [1–4]. Further, during menopause and aging, with changing hormone levels, women are at an increased change of chronic

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conditions such as, cancer, type-2 diabetes, autoimmunity, osteoporosis and cardiovascular diseases.

Hormonal replacement therapy (HRT), use of synthetic hormones, estrogen and progestin in women with intact uterus, or estrogen alone for women who have undergone hysterectomy, has been the most effective treatment for the relief of menopause symptoms but is not without risks [6]. A large randomised trial, by the Women's Health Initiative, reported an increased risk of breast cancer and heart disease [7]. In a later study of estrogen alone, there was no association with increased risk of breast cancer, although, the trial was prematurely stopped because of increased risk of stroke [8]. The Million Women Study by Cancer Research UK and the National Health Services, assessed the effects of HRT use in over one million women, and confirmed that HRT was associated with increased breast cancer risks, especially when both estrogen and progestin were used [9–11]. As a consequence of these findings many women have become reluctant to continue or commence HRT due to fear of adverse risks, which has resulted in a significant decrease in the incidence of breast cancer over the last 10 years [12,13]. Recently, a global consensus statement on menopausal hormone therapy was published which was aimed for women and health care practitioners to make appropriate decisions on the use of HRT [14]. As a result of the effects of HRT, women seek alternative treatment options, particularly complementary and alternative therapies.

Numerous alternative therapies currently available claim to provide a wide array of benefits to menopausal women, however, scientific support is lacking in most instances. Phytoestrogens, black cohosh, red clover, dong quai, evening primrose oil, ginseng, wild yam and maca (*Lepidium meyenii*) have been studied with conflicting results [15]. Due to breast cancer risks associated with HRT and inconclusive results of alternative treatments, physical activity and exercise has been proposed as an alternative means to improve a women's quality of life during menopausal transition and beyond [16–18].

2. The benefits of exercise for overall wellbeing

Physical activity was recognised by the ancient Greeks for health and wellbeing. Hippocrates (460–370 BC) stated “Eating alone will not keep a man well; he must also take exercise. For food and exercise, while possessing opposite qualities, yet work together to produce health”. Physical inactivity is ranked just behind cigarette smoking as a major cause of ill health, placing an enormous economic cost worldwide. In 1996, following the report by the United States Surgeon General's report on the effects of physical activity on health (USDHHS1996), led to an international important component of public health and wellbeing. The short-term benefits of exercise includes, increases in endurance, metabolism and energy, aids in healthier muscles, joints and bones, decreases stress, improved cognitive functioning and promotes better sleeping patterns. Regular exercise participation, either as part of a lifestyle or as part of a disease intervention program are associated with better quality of life and health outcomes, particularly to cancer [19], heart disease, stroke, blood pressure, type-2 diabetes, obesity, osteoporosis, cognitive functioning and mental health and wellbeing [20–23].

A 12 week study in obese middle-aged women undertaking 1 h, 3 days per week resistance and aerobic exercise revealed that metabolic syndrome factors (blood pressure, percent body fat, fasting glucose levels, triglyceride and cholesterol levels) and, visfatin levels, were significantly decreased [24]. Likewise, 3 classes per week, of Bikram yoga improves glucose tolerance in older obese subjects [25], and resistance exercise significantly decreased triglyceride values [26].

An analysis based on 80 studies demonstrated a positive correlation between physical activity and clinical depression, regardless of gender, age or health status [27], and regular exercise by patients after termination of anti-depressants, had lower depression scores than those who were sedentary [28]. On the whole about or regular physical activity participation results in enhanced psychological well being. This includes improved mood [29], self-esteem [30], and reduced anxiety [31] and stress [32].

Menopause is commonly associated with a range of health complaints, including hot flashes, urinary disorders, joint pain and psychological distress. Women reporting menopausal symptoms are generally of overall poorer health [29]. Serious chronic conditions such as osteoporosis and cardiovascular diseases are more likely to occur after menopause than before [30]. In this respect physical activity has a positive impact on bone density in menopausal women. For example, greater physical activity within 4 life domains, of, sport, active living, home, and work was associated with higher peak femoral neck strength relative to load in 1919 menopausal women [31]. Moreover, physical activity has a positive effect in the tibial cartilage of the knee during menopause [32].

It is clear that there are many benefits of exercise on bone [33], cardiovascular, metabolic [34,35], diabetes [36], cancer, longevity [37], psychological well being [38,39] and overall quality of life [26]. Hence, it is appropriate for women to be physically active throughout the menopausal transition and afterwards.

3. To exercise

It is believed that loss of estrogen levels in women to be the main cause of the symptoms associated with menopause. According to the Centre 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. It is recommended that at least 150 min of aerobic activity and 75 min of vigorous activity to be undertaken per week for cardiovascular health. In addition, strength training should be included in order to build bone and muscle strength, aid in body fat burn and increase in metabolism, also important factors during menopause.

For example, in a group of menopausal women aged 55–72 who were involved in an exercise program, of 3 h per week for 12 months, experienced significantly improved physical and mental health and overall quality of life compared to those who were sedentary [40]. More importantly a higher proportion of those who did not participate in the exercise regime reported menopause symptoms (58% reporting symptoms at the beginning of the study compared to 68% at the end of the study), compared to a significant lower reporting in those participating in the exercise study (50% reporting prior to the study compared to 37% at the end of the study). Exercise is therefore considered an important factor to alleviate menopause symptoms. The woman's ability to choose their preferred physical activity increases the likelihood that they will adhere to exercise as a treatment method.

Exercise appears to be a cost-effective alternative with few known side effects. Most importantly, women with greater levels of physical activity report improvements in mental and physical aspects of quality of life [41,42]. Such improvements can even be achieved with low intensity aerobic activity, such as walking and dancing [43].

3.1. Benefits to vasomotor symptoms

The years leading up to menopause, during menopause and early postmenopause, women experience vasomotor related symptoms such as, hot flashes, night sweats and sleep disturbances. Symptoms could be so severe that the overall quality of life of a woman is

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