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Exercise in perimenopausal women
Exercițiul fizic la femeile în perimenopauză

Renata Nicula, Nicolae Costin
"Iuliu Hatieganu" University of Medicine and Pharmacy Cluj-Napoca, "Dominic Stanca" Clinic of Obstetrics and Gynecology

Abstract

Perimenopause is a normal period, representing the women's transition years from the reproductive period to menopause. The main physiological changes are the irregularity of the menstrual periods and the increase of FSH serum levels. Pathomorphologically, the perimenopausal endometrium can present non-proliferative lesions (endometritis, endometrial metaplasia) or proliferative benign or malignant lesions.

The clinical manifestations of perimenopause include various less severe physical and psychological symptoms (hot flashes, mood swings) or severe symptoms, known as premenstrual syndrome.

Perimenopause treatment with nonsteroidal anti-inflammatory drugs or hormonal therapy can cause complications; the search for various alternative therapies to improve the quality of life is continuous.

Exercise is one alternative therapy for perimenopausal symptoms: physical activity may be an effective method of preventing or attenuating specific perimenopausal symptoms.

Key words: perimenopause, therapy, exercise.

Rezumat

Perimenopauza este o perioadă normală a anilor de tranziţie la femei, de la perioada de reproducere la menopauză. Principalele modificări fiziologice sunt neregularitatea perioadelor menstruale şi creşterea nivelurilor serice de FSH. Morfopatologic, endometrul din perimenopauză poate prezenta leziuni nonproliferative (endometrită, metaplazie endometrială) sau leziuni proliferative benigne sau maligne.

Manifestările clinice ale perimenopauzei includ diferite simptome, mai puţin severe, fizice şi psihice (bufeuri, schimbări bruşte de dispoziţie) sau simptome severe (sindromul premenstrual).

Tratamentul în perimenopauză cu medicamente antiinflamatoare nesteroidiene sau terapia hormonală pot provoca complicaţii; are loc astfel o căutare continuă de diverse terapii alternative, pentru a îmbunătăţi calitatea vieţii.

Exerciţiul reprezintă o terapie alternativă pentru simptomele din perimenopauză: activitatea fizică poate fi o metodă eficientă de prevenire sau atenuare a simptomelor specifice perimenopauzei.

Cuvinte cheie: perimenopauză, terapie, exerciţiu.

Introduction

Perimenopause, also called menopausal transition, is the term used to describe the women's transition years from the reproductive period to menopause. This period covers the years before and after the last menstrual period (this latter period can only be established in retrospect).

In this interval the woman's body makes a natural shift from more or less regular cycles of ovulation and menstruation toward permanent infertility, or menopause (Jetley et al., 2013). The period lasts 4-7 years and the average onset age is 47 years (McKinlay et al., 1992). In clinical practice and in the literature, the term menopausal transition is preferred (Soules et al., 2001).

In 1990, there were an estimated 467 million women in this state and this number is expected to increase to 1,200 million by the year 2030 (***, 1996).

Pathophysiology, pathomorphogy and clinical manifestations of perimenopause

From a medical standpoint, perimenopause defines the period of time when menstrual periods start to become irregular and serum FSH levels increase, until 12 months have passed since the last menstruation. It is worth noting that hormonal changes underlying the period of perimenopause occur gradually and therefore, the possible effects of perimenopause can occur before and continue after the time defined above.

Endometrial changes are most commonly encountered in perimenopause, due to the increased receptivity of the endometrium toward changes in endocrine balance, compared to other genital structures.

Histological changes in perimenopausal endometrium

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*Address for correspondence: "*Iuliu Haţieganu" University of Medicine and Pharmacy, No.8, Victor Babes Street, PC 400012, Cluj-Napoca
E-mail: renatanicula@yahoo.com
Corresponding author: Renata Nicula

can be classified as non-proliferative lesions (endometritis, endometrial metaplasia) or proliferative lesions: benign, non-invasive (endometrial polyps, endometrial and stromal hyperplasia) or malignant, invasive (endometrial cancer) (Huston & Lanka, 2001).

Dysfunctional uterine bleeding is a clinical term meaning that bleeding is not due to pathological organic lesions; endometrial curettage plays an important role in excluding organic uterine disorders (Albers et al., 2004; Johnson, 1991). In perimenopausal women, atypical uterine bleeding is most commonly dysfunctional in origin (Jetley et al., 2013). Also, there is a high prevalence, incidence, and spontaneous rate of resolution of intermenstrual and postcoital bleeding in naturally menstruating women during the perimenopausal years (Shapley et al., 2013).

Women are vulnerable to various physical and psychological symptoms affecting their quality of life (Nayak et al., 2014). Frequently reported symptoms fall into several categories, including physical disturbances such as hot flushes, psychological complaints such as mood swings, and other changes that may impair personal or social interactions and diminish the overall quality of life (Speroff, 1999).

The early menopausal symptoms are hot flashes, night sweating, anxiety, and irritability (Assadi, 2014). Vasomotor symptoms (VMS) (hot flashes, night sweats) are experienced by most women during the menopause transition (Gold et al., 2006). Several other symptoms, including vaginal dryness, depression, headache, and sleep disturbance, can occur more frequently in this period (Li et al., 1999). Also, social changes can be present that may affect the quality of life (Kumari et al., 2005). Sleep disturbance is an important change in menopause because it affects the quality of life and can lead to other conditions such as depression (Moreno-Frías et al., 2014).

Severe symptoms, known as premenstrual syndrome, include physical symptoms (breast tenderness, abdominal bloating, nausea, and headache), as well as a variety of emotional symptoms, including depression, anxiety, poor concentration, and irritability (Chung, 2014). During perimenopause, premenstrual syndrome symptoms increase in severity and duration (Huston & Lanka, 2001).

Perimenopausal women can experience rapid bone loss at skeletal sites with both cortical and cancellous bone, increasing the prevalence of osteoporosis following menopause (Khan et al., 2014).

The incidence rate of cardiovascular diseases (CVD), the leading cause of death in women, increases after the age of 50 (Lloyd-Jones et al., 2010), when most women are transitioning to menopause. This suggests a possible link between the menopausal transition and the development of CVD. Whether it is menopause or age related-changes that are associated with the increase in the incidence rate of CVD remains an active research area. Studies show that earlier age at menopause (Hu et al., 1999), premature menopause, and surgically induced menopause (Rivera et al., 2009; Lokkegaard et al., 2006) are significant risk factors for CVD, suggesting an effect of menopause on CVD risk that is independent of age.

Cardiovascular risk starts to increase during the menopausal transition. For example, the carotid artery undergoes adaptation that is reflected in adverse changes in intima-media thickness and adventitial diameter. These changes may have an impact on the vulnerability of the vessel to disease in older women (El Khoudary et al., 2013).

The occurrence of low to severe problems during perimenopause or postmenopause is positively associated with overweight/obesity (Sayón-Orea et al., 2014). Obesity and overweight are associated with many comorbid conditions and are major contributing factors to cardiovascular disease. The increased proportion of overweight and obese people in Western societies has been largely attributed to behaviors that include sedentary lifestyle and dietary excess. Women are at particular risk during perimenopause, when hormones change and metabolism slows (Zargarian et al., 2014).

Findings from large cohort studies have shown higher adiposity linked to more VMS (Gold et al., 2006). It has been suggested that associations between adiposity and VMS may be menopause stage-dependent (Hyde Riley et al., 2004), with body fat possibly acting as a risk factor for VMS early in the menopause transition (Thurston et al., 2008), and as a protective factor later (Thurston et al., 2011). Notably, findings also indicate stage-dependent associations between body fat and estradiol (E2), with a higher body mass index (BMI) associated with lower endogenous E2 early in the transition, but higher E2 later in the transition (Randolph et al., 2011; Wildman et al., 2012; Freeman et al., 2010). An adverse adipokine profile is associated with more VMS, particularly early in the menopause transition (Thurston et al., 2013).

Work may be a risk factor for early symptoms of menopause; a stressful job, such as clinical work compared to office work, can cause disorders (Assadi, 2014).

Treatment of perimenopause

It is best to start with nonsteroidal anti-inflammatory drugs (NSAIDs), which effectively reduce heavy menstrual bleeding. Perimenopausal women with heavy bleeding uncontrolled by NSAIDs, or other forms of dysfunctional uterine bleeding, can benefit from continuous, combined hormonal therapy with estrogen and progestin; hormonal therapy with estrogen and a cyclical progestin; or a cyclical progestin alone. Intrauterine devices (IUDs) containing levonorgestrel also effectively reduce bleeding and may avoid surgical intervention. If medical management fails, endometrial ablation offers an effective, minimally invasive alternative to hysterectomy (Chen et al., 2009).

Menstrual bleeding problems were the major determinant of elective hysterectomy (Gibson et al., 2011), but hysterectomy should be considered only when medical management or endometrial ablation fails (Chen et al., 2009).

Considering that hormonal therapy can cause complications including malignancy (risk of neoplasia of the endometrium and possibly the breast) (Hulley et al., 1998; Rossouw et al., 2002; Beral, 2003), the search for various alternative therapies to improve the quality of life is continuous. There are studies that have proved the effectiveness of yoga therapy in managing the distressing perimenopausal symptoms (Nayak et al., 2014).

Some women use self-care strategies, including life-style modifications, over-the-counter preparations and comple-

mentary and alternative therapies, such as herbal preparations, exercise programs and relaxation techniques. Relaxation techniques consist of a group of behavioral interventions. They are considered relatively harmless, but their effectiveness in treating vasomotor symptoms and sleep disturbances remains debatable (Saensak et al., 2014).

Diet in perimenopausal women

Dietary patterns rich in whole grains, fruit, vegetables, nuts, and omega-3 fatty acids and low in refined grains and saturated and *trans* fats have been suggested to offer a significant protection against heart disease (Hu et al., 2002). One such dietary pattern - the Mediterranean diet - was first shown to benefit heart health; a Mediterranean-style dietary pattern was inversely associated with insulin resistance and metabolic syndrome (Rumawas et al., 2009). Also, this healthy dietary pattern is inversely associated with overweight/obesity in perimenopausal and postmenopausal women (Sayón-Orea et al., 2014).

Phytoestrogens ("plant estrogens") are heterocyclic phenols found in many plant foods. There are three major categories: isoflavones, coumestans, and lignans. Lower rates of VMS have been reported in most studies, including randomized trials, in postmenopausal women using soy isoflavone supplements (Ishiwata et al., 2009; Jenks et al., 2010). However, the effect has not shown a clear-dose response relation, has largely not been reported for perimenopausal women (as noted in the position statement), even though perimenopausal women have rates of VMS at least as high as those of postmenopausal women (Gold et al., 2006), has only involved supplements and not dietary isoflavones, and has largely only been related to reducing VMS in women who have them, rather than preventing newly developing incident VMS. Some studies suggest that a clinically significant or large effect is improbable.

Positive effects of exercise in perimenopausal women

One alternative therapy is exercise, which is one of the most commonly used alternatives for perimenopausal symptoms (Daley et al., 2006). Physical activity is associated with many health benefits, including a decreased risk of cardiovascular disease, metabolic syndrome, obesity, cancer, osteoporosis, and depression (***, 2008).

Physical activity may be an effective way of preventing or attenuating perimenopause-related symptoms, and it has been shown to improve the quality of life in menopausal women (Kim et al., 2014). Several previous studies have shown that physical activity significantly reduces perimenopausal symptoms (Villaverde-Gutiérrez et al., 2006; Gold et al., 2000), but other studies have found that physical activity improves general symptoms such as physical and psychosocial symptoms, although it does not influence specific symptoms such as vasomotor and sexual symptoms (McAndrew et al., 2009; Haimov-Kochman et al., 2013; Slaven & Lee, 2007; Mirzaiinjmabadi et al., 2006). A meta-analysis reported inconsistent results regarding the effect of physical activity on perimenopausal symptoms, with mixed results being observed for different types of symptoms (Sternfeld & Dugan, 2011). In addition, engaging in habitual physical activity at least 60 minutes/day showed favorable effects on the prevention of perimenopausal symptoms, and a high total physical activity level was also associated with less climacteric symptoms (de Azevedo Guimarães & Baptista, 2011; Skrzypulec et al., 2010). A previous study in multiethnic groups of midlife women showed that the specific types of women's physical activity influenced the prevalence and severity of menopausal symptoms, which differed by ethnicity (Chang et al., 2013).

A moderate level of physical activity is associated with reduced psychosocial and physical symptoms in perimenopausal women (Kim et al., 2014).

Physical activity and VMS

In recent years, a number of intervention studies have tested the effect of physical activity (generally aerobic exercise and most often walking) on VMS. In several studies, physical activity is associated with fewer VMS (Gold et al., 2006; Gold et al., 2004), but there are also studies which report increased VMS with higher levels of activity (Romani et al., 2009; Whitcomb et al., 2007; Aiello et al., 2004).

Another study showed that 12 weeks of moderate-intensity aerobic exercise do not alleviate vasomotor symptoms, but may result in small improvements in sleep quality, insomnia, and depression in midlife sedentary women (Sternfeld et al., 2014).

Several mechanisms can contribute to the effects of exercise on VMS:

1) Stress seems to be a precipitating factor in hot flashes, which may result from an imbalance in the autonomic nervous system (Berntson et al., 1997; Watkins et al., 1998). The shift in that balance as a result of exercise training is a potential mechanism by which exercise could reduce the occurrence of VMS.

2) A single sustained bout of vigorous exercise releases endogenous opioids, particularly β-endorphins (Boecker et al., 2008; Harber et al., 1997; Heitkamp et al., 1996). Endogenous opioids are biochemically similar to exogenous opiates and have diverse physiological effects, including temperature regulation (hypothermia), decreased sensitivity to pain, and decreased heart and respiratory rate, all of which could be responsible for a decrease in either frequency or bother of VMS (Sternfeld & Dugan, 2011). Exercise helps hot flashes by increasing endorphins in the brain. A decrease in brain opioids is associated with inactivity and more hot flashes, so more exercise and increased endorphins means less hot flashes. Women who exercise aerobically 3 h/week have far fewer flashes than women who are sedentary (Huston & Lanka, 2001).

3) Physical activity could "distract" women from attention on their hot flashes by habituating them to the feelings of increased heat and heat dissipation through sweating that accompany increases in physical effort and associating those feelings with behaviors that may make them feel good in other ways. This is similar to the "distraction" theory of how physical activity improves mental health and the sense of well-being (Leith, 1994).

Physical activity and premenstrual syndrome

Several studies suggest an inverse relation between higher levels of physical activity and lower rates of somatic complaints and fewer difficulties with sleep (Collins & Landgren, 1995; Wilbur et al., 2005). There is

also considerable evidence that physical activity reduces feelings of bodily pain in general.

Proper diet and exercise can diminish physical and emotional symptoms of premenstrual syndrome (Huston & Lanka, 2001).

Aerobic exercise increases hemoglobin, hematocrit, red cell count and platelet count, and decreases the levels of prolactin, estradiol and progesterone, resulting in an improvement of fatigue, impaired concentration, confusion and most premenstrual symptoms (El-Lithy et al., 2014).

Physical activity and mood/stress control and sleep quality

Another significant benefit of regular physical activity is enhanced mental health, including protection against the onset of depressive and anxiety symptoms and disorders, reductions in existing symptoms of depression, anxiety and distress, and enhanced feelings of well-being (***, 2008).

Stepping up circulation and increasing oxygen to every cell improve the capacity to handle stress. Beta-endorphins are released during vigorous exercise, producing a relaxed and ease state afterward (Huston & Lanka, 2001).

Regular exercise reduces depression and is a practical means of handling the emotional stress of everyday living (Benson & Stuart, 1993).

Also, exercise helps to sleep soundly, because the body is more tired. However, exercise must be avoided just before bed time, because the stimulation may actually prevent getting to sleep (Huston & Lanka, 2001).

Physical activity and changes in body size and composition/weight control

Changes in body composition (increased fat mass and decreased lean mass) and in fat distribution (from a more gynoid pattern to a more android pattern) do seem to be influenced by the menopausal transition, as well as by chronological aging (Ley et al., 1992; Zamboni et al., 1992).

Physical activity seems to minimize weight gain and changes in body composition and fat distribution experienced at midlife, and might attenuate the rapid bone density loss that occurs. Given these benefits, clinicians treating perimenopausal women should encourage their patients to follow guidelines for physical activity (≥150 minutes a week of moderate-intensity activity) (Sternfeld & Dugan, 2011).

The mechanisms through which physical activity may attenuate the impact of both age and menopause on the change of weight, body composition, and fat distribution include:

1) More active individuals tend to be leaner than sedentary individuals at any given point in time (DiPietro, 1995), which means that active midlife women have an advantage as they enter the menopausal transition in terms of starting out with a lower BMI, lower fat mass, greater lean mass, and less central adiposity.

2) Physical activity may slow the rate of change of weight, both with menopause and over time. Although not entirely preventing weight gain with age, it may protect against the development of obesity (Sutton-Tyrrell et al., 2010). Compared with those women engaging in a level of physical activity approximating the current recommendations for general health (150 minutes a week of moderate-intensity activity) (***, 2008), less active women had significantly greater amounts of intraabdominal fat, regardless of menopausal status, but did not differ in terms of the level of subcutaneous abdominal fat.

Exercise speeds the metabolic rate and burns calories. Exercise builds muscle, the most biologically active tissue; a larger lean body mass will increase the resting metabolic expenditure (RME). RME means 60-75% of the calories burned every day (Leibel et al., 1995).

If exercise is combined with diet, it becomes unnecessary to severely limit or restrict the diet. Nutritious food and adequate calories must be included, only eating them with both hands should be avoided (Huston & Lanka, 2001).

Physical activity and cardiovascular diseases

Exercise improves several cardiovascular risk factors:

- It lowers blood pressure
- Lowers total cholesterol, bad LDL, and triglyceride levels (independent risk factor for women) and increases good HDL levels
- Reduces the risk of blood clots by decreasing platelet adherence and increasing fibrinolysis factors
- Lowers insulin levels, by burning glucose (an increased insulin level for a long time promotes arterial plaque formation and high blood pressure)
- Improves the strength and the pumping efficiency of the myocardium. A fit heart can have up to 36000 beats/day fewer than an unfit heart (Reichman, 1996).

Physical activity and intestinal function

Less constipation results from regular exercise, because the intestinal tract is stimulated, along with the rest of the body. Physical activity stimulates digestion and a more complete absorption of nutrients (Huston & Lanka, 2001).

Physical activity and bone density

Regular physical activity is among the primary determinants of bone mineral density (BMD) and is a key contributor to overall musculoskeletal health, because of the responsiveness of bone to the mechanical forces that physical activities place on it (***, 1995). Both weight-bearing endurance activities, such as walking and running, and resistance exercises elicit this response, especially at the lumbar spine and femoral neck (Kelley, 1998; Palombaro, 2005; Martyn-St James & Carroll, 2006). Although the increase in BMD observed in exercise intervention studies in response to physical activity is modest (about 1%-2%), animal studies have shown that this is accompanied by a large increase in the resistance of bone to fracture (***, 2008).

Some studies also suggest that maintenance of regular physical activity over time results in attenuated bone loss, compared with reduced physical activity or consistently sedentary behavior (Morseth et al., 2010; Rikkonen et al., 2010).

Exercise has a more beneficial effect in perimenopausal women in building bone, than after they reach menopause; after menopause, exercise mainly works to keep the bone that they already have (Huston & Lanka, 2001).

Physical activity and brain changing and longevity

Physically fit people are protected from several central nervous system changes that have traditionally been thought to be due to aging. Exercise increases neurotrophin levels, the ability to process and retain new information, the physical reaction time. These abilities are best protected

with complex physical activities such as aerobic dancing, racquet sports, and swimming; the ideal activity for brain improvement is one that also involves some decision making during exercise (Huston & Lanka, 2001).

Regular exercise can prolong life: death rates from all causes are reduced by 44% in women and men who exercise regularly; this includes heart diseases, cancer and even accidents. The reduction in heart attack is 50%.

Physical activity and cancer risk

Cancer, particularly breast cancer, whose incidence rate increases after menopause, relative to premenopause, is another adverse outcome relevant to perimenopausal women that may be positively influenced by regular physical activity. A large body of observational studies suggests that women who are regularly active have a 25% to 30% lower risk of developing postmenopausal breast cancer than women who are inactive (Sternfeld & Lee, 2009). There is also a reduction in risk for premenopausal breast cancer, although the magnitude is less (about 20%-25%) (Sternfeld & Lee, 2009). In addition, a growing body of literature suggests that physical activity after a breast cancer diagnosis and treatment is associated with lower rates of recurrence (Holmes et al., 2005) and a lower risk of all-cause mortality (Sternfeld et al., 2009; Irwin et al., 2011).

Potential mechanisms that may account for these observations include lower levels of circulating endogenous hormones, such as estrogen, sex hormone-binding globulin, and insulin-like growth factors, better maintenance of energy balance, and enhanced immune function (McTiernan et al., 1998; Lee, 1995).

Former women athletes who continue to exercise have a 50% decreased incidence of breast cancer, and a 60% decrease in cancers of the cervix, ovaries, uterus, and vagina (Frisch et al., 1987).

Finally, there is increasing evidence that physical activity enhances the overall quality of life in the population as a whole, as well as in patient populations, such as breast cancer survivors (Mandelblatt et al., 2011).

Fitness plan for perimenopausal women

The selected type of plan must be an exercise plan that will realistically fit into the person's life, based on the goals set, age, and the current level of fitness. The goals that can be considered are:

- Cardiovascular fitness
- Weight control
- Muscular strength
- Improved flexibility
- Coordination and balance
- Osteoporosis prevention
- Better brain functioning
- All of the above.

The exercise plan must be enjoyed and regarded as a new part of life, not as a temporary inconvenience (Huston & Lanka, 2001).

The exercise plan

Since the 1980s, the recommendations of most fitness experts have been to exercise 3-4 times/week, at a level that keeps the heart within a specified target zone continuously for 30 to 60 minutes at a time. The formula calls for aerobic conditioning, muscle strengthening, and flexibility exercises (Pollack & Froelicher, 1990), but takes a lot of planning to incorporate it into a busy life.

According to a slightly different approach, acceptable physical fitness could be accomplished by moderate-intensity physical activity carried out for 30 minutes/day; in addition, the activity does not need to be continuous. With 30 minutes of exercise accumulated in 8-10 minute segments every day, a person can become moderately fit. It is necessary to incorporate activities that burn 200 calories/hour, for a total of 30 minutes.

Brisk walking on level ground, cycling under ten miles an hour, using a power lawn mower, general house cleaning, playing golf, all burn 4-7 calories/minute. More strenuous activities, such as walking uphill, moving furniture, cycling over ten miles an hour, using a hand mower, burn over 7 calories/minute. Everything counts, cycling to work, walking briskly to lunch, using the stairs instead of the elevator, 3-10 minute events performed at about the same pace as brisk walking (Huston & Lanka, 2001).

Exercises for perimenopausal women

a) Aerobic conditioning

Aerobic exercise means systematic physical activity designed to increase oxygen consumption. The increase of aerobic capacity (the amount of oxygen processed in a given amount of time) improves the functioning of the respiratory and cardiovascular systems, and increases muscle tone. Aerobic activity involves the body's large muscles, speeds up the metabolic rate, increases the heart rate, delivers more oxygen to every cell in the body, burns calories. Aerobic capacity is the best measure of the body's physical fitness.

Aerobic activity can be anything from running to dancing to climbing stairs to raking leaves. The choice of activity should be based on the current level of fitness, on how it fits into the lifestyle, and the fitness goals established.

A convenient way to track individual progress is to notice that it takes more aerobic activity to keep the heart rate in the 60 to 80% target range. Beginners should start in the lower part of the target heart range and work up gradually to the 80% level, but not exceed the upper limit (Huston & Lanka, 2001).

b) Muscle strengthening

Stronger muscles in perimenopausal women protect from joint and tendon injuries, increase the ability to burn calories, control weight, and improve bone density. Stronger muscle leads to being more agile and graceful, to having a better posture and a confident gait, and to fewer clumsy accidents.

A muscle is strengthened by contraction against resistance, some form of weight-bearing activity. The majority of aerobic exercises (walking, jogging, dancing, step climbing, and so on) require using lower body muscles; to acquire upper-body muscle strengthening, hand-held weights must be used during these activities.

Isometric exercise (active muscle contraction against steady resistance), elastic resistance, and body-weight resistance (push-ups, pull-ups) are also effective for muscle strengthening. Swimming is great for upper body training, and is fantastic aerobic work.

c) Stretching exercises

Stretching exercises promote flexibility, improve the

posture and help relieve back pain. A stretch should be sustained for about 20 seconds to be effective. The muscles must also be "warmed up" before stretching, to avoid injury. Stretching the muscles at the conclusion of the exercise routine, while they are still warm, will contribute to being supple and prevent post-exercise soreness.

Yoga is an excellent method for improving and maintaining flexibility, especially hatha yoga meaning physical yoga (Huston & Lanka, 2001).

Components of an ideal workout

There are four components:

1) Warm-up and stretching – is an important part of exercise routine, especially for midlife, and if a person has been sedentary, it helps avoiding injuries. Once the heart rate has increased or a slight sweat has been induced, the stretching exercises must be done, to get the muscles ready for increased range of motion and stepped-up activity.

2) Aerobic workout – can be any type of activity that gets the heart rate into the desirable range for age and the physical fitness level.

3) Muscle strengthening – includes good exercises to add after aerobic workout, when muscles are warm and supple. Ideally, they should include all major muscle groups. Alternating these exercises with days without aerobic work can add some variety and prevent the boredom of the exercise program.

4) Cool-down and stretching – has an equal importance to the warm-up. A gradual slowdown of the heart rate allows the increased blood flow to the muscles and skin to subside. This is an ideal time to do some more stretching exercises to prevent muscle stiffness.

Caution: avoid cold shower after exercising (this puts a huge strain on the heart by constricting the skin blood vessels), and also wait to cool before using a sauna (heat draws more blood into the skin and this may result in fainting) (Huston & Lanka, 2001).

Conclusions

1. Wellness involves conducting one's life in a fashion that decreases the chance of diseases and enhances the verve for living.

2. Good nutrition, a healthful diet and exercise have a profound influence on the second half of a person's life.

Conflicts of interest

Nothing to declare.

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