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The key role of physical exercise in the prevention and treatment of osteoporosis

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Summary

Osteoporosis is a commonly occurring condition that affects, mainly elderly people. Bone loss may be caused many factors, such as menopausal period, slender body structure, inappropriate diet, or genetic determinants. The systematic and properly performed physical activity is of a significant importance in the prevention and control of the disease symptoms. Beneficial results are obtained by implementation of exercises of the following types: strength, endurance, stretching and mixed efforts. Performing physical activity accurately results in lowering of the risk of early osteoporosis and reduces the intensity of bone degeneration processes by inhibiting and stimulating appropriate mechanisms within the bone tissue.

Keywords: : physical activity, osteoporosis, prevention, strength training

Introduction

Osteoporosis, is a condition that leads to gradual bone loss and demineralization. This contributes to the reduction of their strength, which often causes excessive fragility. In case of elderly people, it can be a serious health problem associated with a long-term immobilisation of the limb or the entire body, in the case of fractures in the lower limbs. The vast majority of people in old age can not move with the help of crutchesor a balcony, because it is associated with a lot of physical effort. In addition, immobilization contributes to the acceleration of degenerative processes within the skeletal system. An important role in prevention and

slowing down the process of demineralization is properly implemented physical activity [1-3].

The importance of different types of physical exertion

Physical activity, depending on its nature and type, may have a different effect on the bones in which osteoporosis features are present. Exercises such as swimming in the pool or cycling, or efforts with moderate intensity, reduce the activity of the so-called bone-like cells, called osteoclasts. This mechanism leads to inhibition of degenerative processes in the area of bone tissue.

Exercises which are included in the aerobic group, performed intensively and systematically, can in turn affect the stimulation of bone tissue growth by stimulating the osteoblast function - called osteogenic cells.

Preventive behavior has a significant influence on the development of osteoporosis. Properly undertaken activity in life, contributes to the delay of the occurrence of the disease or the development of degenerative changes. Prophylaxis of osteoporosis based on the use of physical exercise, consists of the following elements:

- training aimed at strengthening muscle strength, which should also include strengthening of postural muscles,

- strength training,

- endurance training [4-7] .

Fig. 1. Strength exercise using a dumbbells

A significant aspect is also the education about safe and controlled falls and skillful standing in the event of their occurrence. An important issue is also the reeducation of walking, it should be ensured that it is as ergonomic and physiological as possible. The planned improvement should also include posture training, exercises to improve motor coordination, proprioception training, which allows you to improve the feeling of the ground and control the body position in the surrounding space. In particular, in the case of elderly people, the key issue is to learn the scope of everyday activities and education regarding risk factors.

In addition to the above-mentioned recommendations, it is important to remember about the importance of stretching exercises that allow you to keep your muscles in the right condition and in readiness to make the effort. Recommendations on the frequency of exercise suggest that endurance exercises should be performed at least twice a week for 20 minutes, while their intensity should be 40-60% of the maximum reserve of cardiac contractions. In

turn, stretching exercises should be carried out every day or every other day, especially in the morning and immediately after physical exercise, and they should last at least 5- 10 minutes [8-10].

Fig. 2. Exercise improving proprioception and postural muscle strength with the use of tape and sensoromotor cushion.

One of the most beneficial forms of activity recommended in case of people with osteoporosis is going for a walk. Their significant influence consists in the activation of the entire organism. During the exercise, large muscle groups are activated, in turn the bones undergo the force of gravity, which in combination with the rhythmic movements of individual body elements and alternate tensioning of various muscle parts results in an effective stimulation of the entire skeletal system. The work of the whole organism has a positive effect on the bone formation balance. Walking is recommended every day at a moderate pace, lasting at least 30 minutes.

When performing resistance exercises, you should remember to take a stable starting position, as well as breath control. Elderly people very often experience apnea when doing this type of exercise. When planning strength training, you should include about 10 exercises that cover the main muscle groups. Resistance exercises to be effective should be undertaken at least twice during the week and last 20-30 minutes at once [11-16].

Summary

Osteoporosis occurring among elderly people and related complications in the form of fractures, often contributes to long-term immobilization of the patient. It becomes an important reason for decreasing the level of physical activity and independence. Progressive loss of bone mineral density can be inhibited by activation and regular use of properly planned physical exercise. Also people with an active lifestyle are less exposed to the risk of developing osteoporosis. For the prevention and treatment of osteoporosis, regular exercise is recommended. Effective is the use of: resistance exercise, endurance training, stretching and equivalent exercises, as well as positively affecting the proprioceptive system. Walking in the open air, during which large muscle groups are involved in the entire body is particularly important, as it significantly improves physical fitness and decrease the process of bone tissue degeneration.

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