METHODOLOGY OF MEDICAL RECOVERY IN OSTEOPOROSIS

Anca JIANU
Faculty of Physical Education and Sport, Spiru Haret University, Romania

Abstract: Introduction. Osteoporosis is a systemic skeletal disease characterized by decreased bone density and microarchitectural deterioration of bone tissue, resulting in increased bone fragility and fracture risk. In view of increasing life expectancy, osteoporosis will be a major public health problem in the future. The etiology of osteoporosis includes a number of risk factors that we can not control (age, gender, hormones, ethnicity, heredity, various diseases such as liver, thyroid, kidney, medication), but also risk factors we can intervene (sedentary, daily nutrition).

Content. Osteoporosis can be prevented and treated through a proper lifestyle based on nutrition rich in calcium and exercise that requires the bone periosteum and improves its resistance. The possible complications of this disease, from pain to the impossibility of being functionally independent, require the need for hygiene-dietetic, medication and kinetic treatment.

Conclusions. Specific kinetotherapy for osteoporosis contributes to the formation of the bone matrix and its mineralization, but also to minimizing the risk of fractures by preventing falls. Kinetic programs improve articular mobility, postural muscle tone and the strength of the entire muscular body. At the same time, proper dosing and individualization of exercise improves motor performance, reeducate the balances and coordination.

Keywords: osteoporosis, recovery, life style, physical exercise.

Introduction
Osteoporosis is a systemic skeletal disease characterized by decreased bone density and deterioration of bone tissue microarchitectomay, resulting in increased bone fragility and a marked increase in the risk of fracture [1]. In view of increasing life expectancy, osteoporosis will be a major public health problem in the future.

Decrease in bone mass occurs with age. Until 20-25 years, more bone is formed by the increased number of osteoblasts and is less absorbed, between 25-40 years there is a balance between loss and bone formation, and after the fourth decade of life, both sexes osteoporosis is progressively installed with a loss of bone mass of 0.3-0.5% per year [2].

Women are more affected after menopause than men due to lower estrogen levels that cause bone imbalance by increasing osteoclasts [3]. Moreover, women lose 0.5-1% of bone mass in the first 20 years post-menopause, and this process slows down after the age of 65 [4].

The decrease in bone density leads to an increase in the number of fractures caused by minor traumas and even daily activities.

In recent years, there has been a decrease in the mean age of osteoporosis and fractures. The etiology of osteoporosis includes a number of risk factors that we can not control (age, gender, hormones, ethnicity, heredity, various diseases such as liver, thyroid, kidney, medication), but also risk factors we can intervene (sedentary, daily nutrition) [5].

In this context, we consider it necessary to intervene early to prevent the disease and, where it is installed, a rational lifestyle based on drug therapy, balanced nutrition and well-structured and dosed kinetic programs is required.

Studies have shown that bone mass can be improved by exercise until the age of 80[6]. Specific kinetotherapy, adapted to the particularities of patients with osteoporosis, contributes both to their prevention and recovery.

Under the conditions of the presence of a secondary cause of osteoporosis (endocrine and gastrointestinal diseases, diseases of the hematogenous marrow, drugs, chemotherapy, alcohol, immobilization, rheumatoid arthritis), the specific treatment has the purpose of removing the cause [7].

Content
The progression of osteoporosis is slow and silent, most often the first sign being an unexpected fracture. Clinical manifestations of osteoporosis include general non-specific symptoms: diffuse or migrane pain in bone, periostal and articular, physical asthenia, and symptoms related to deformities due to skeletal and articular misalignment in advanced phases of the disease [8].

Osteoporotic areas are the spine, the hip, the carpian joint [9]. Rehabilitation treatment aims at achieving the following general objectives [10]:

• Stimulation of osteoform cells,
• Stimulation of correct body alignment,
• Stimulation of bone metabolism,
• Maintaining musculoskeletal integrity.

To achieve these goals, it is recommended:
1. **Hygiene-dietetic treatment** to prevent the appearance and worsening of bone demineralization. For this purpose, foods rich in calcium and vitamins A, C, D are introduced into the diet to help with its absorption:
- Fruits, vegetables, carbohydrates such as bread, rice, pasta, potatoes,
- Protein represented by eggs, dairy products (cheese, yogurt, milk), fish and seafood,
- It is recommended to limit the consumption of caffeine and carbonated drinks,
2. **Drug treatment** shall:
- Calcium administration at different doses, by gender: for female subjects 1000-1500 mg, and for male subjects 800-1000 mg daily,
- Inhibition of bone loss by the administration of estrogens, bisphosphonates, anabolic steroids, testosterone, calcitonin,
- Stimulation of bone mass formation by administering vitamin D and its derivatives.
3. **Surgical and orthopedic treatment** is required to prevent or correct morphological deformations and limit or compensate for functional deficits. For back pain, result of spinal compression or cifho-scoliotic changes, stiff half lumbar support, and for those with hip pain, the walking stick can be used in the hand opposite to the painful hip. In fractures, surgical treatment involves bone reassignment by orthopedic or surgical reduction with osteosynthesis material.
4. **Kinetic treatment** is applied for prophylactic and curative purposes because physical exercise acts as a stimulus to the periosteum by producing an electrical potential called piezoelectric effect by slipping the bones of collagen to one another, generating increases in bone mass[11].

The objectives of kinetotherapy are:
- Improvement of pain and restant inflammation,
- Improvement of paravertebral contractions,
- Toning of deficient muscles (especially abdominal and paravertebral),
- Reeducation of articular mobility,
- Reeducation of coordination and balance,
- Increasing the quality of life of the patient, with the normal course of daily activities.

The means used to achieve the set kinetic objectives are:
- Walking and / or running according to the patient's effort, on a flat ground at first,
- Therapeutic sports, the most recommended being swimming and cycling, without being practiced in competitive mode,
- Avoiding loud and creeping posts along with avoiding head bowing[12],
- Educational therapy represented by:

1. Keeping the patient in good position in orthostatism, sitting and lying down, a bad posture leading to pain and instability,
2. Patient compliance with the Principles of the Back School, requiring correct posts to lift, push, pull and carry objects [13],
- Combination exercises with gravity loading, either with your own weight or with extra weights.

The actual kinetic program can include three types of exercises: the warm-up exercises, stretching exercises and exercises to tone the whole body muscles and improve balance. To these can be added breathing exercises with a relaxing role. We recommend the following exercises in the seating:
- Lift shoulder towards ears and lower shoulder, 8-12 repetitions,
- Roll shoulders forwards, upward and then backwards and down, 8-12 repetitions,
- Swing one arm forward to approximately shoulder height, and swing it back behind as far as is comfortable, 8-20 repetitions on alternate arms,
- Dig the heel od the foot towards the floor with the toeslifting upward, then point the toe towards the floor, and lift the heel away from the floor, aim for the feel and toe to land in the same place to ensure the full range of motion in the ankle is achieved, 8-12 repetitions on each foot,
- Bring both arms to cross in front at chest level, smoothly and gently open both arms out to the sides and slightly back, return the arms to the front, 8-12 repetitions,
- Place one arm on the side of the chair, lift other arm up, bend over slightly towards the side with the supporting arm, stretch only to a point where a mild tension is felt at the side of the trunk, keep a space between shoulders and ears and lengthen the neck, hold the stretch for 8-12 seconds,
- Hold a rolled-up towel in the hands, with one hand above the other, rotate both hands in opposite directions as though wringing the towel, pull the hand apart slightly before returning them to the starting position, 8 repetitions,

We recommend the following exercises in orthostatism:
- Bend directly to the side in a controlled manner and return to the central position, bend directly to the other side in a controlled manner and return to the central position, 8-16 repetitions on each side, alternating,
- Squats with arm circles, 30 seconds,
- Lift alternate the knees in front of the body, keep the chest lifted and do not allow the body to bend forwards as the leg lift, perform for 1-2 minutes.
- Walking for 2-4 minutes,
Hamstrings stretch: step forward-a shoulder-width stride, bend the back knee and rest the hands lightly on the thigh of the bent leg, the other leg should be extended in front of body, but do not lock the knee, bend forwards from the hips, supporting the weight with the hand on the bent leg, until a mild tension is felt at the back of the straight leg, hold the stretch for 10-12 seconds on each leg.

Quadriiceps stretch: raise the heel of the opposite leg towards the buttocks, use the hand to hold the leg in place, hold the stretch for 10-12 seconds.

Calf stretch, triceps stretch, chest stretch,

Stand behind a sturdy chair and rest the hands on the back of it, place the feet hip width apart, raise onto the toes and lower to the starting point, keep an upright posture through, 8-12 repetitions,

Biceps curl with weights, 8-12 repetitions and gradually build up to 16-24.

Conclusions
Osteoporosis is a public health issue and is clinically expressed by vertebral compression, fracture of the fist and femoral neck.
Specific kinetotherapy for osteoporosis contributes to the formation of the bone matrix and its mineralization.
A properly dosed kinetic program prevents falls and minimizes the risk of fractures.
Early rehabilitation treatment improves the muscular strength of the whole body in conditions of joint mobility.
Kinetic programs maintain and improve motor performance, reeducate balance and coordination.
Proper recovery treatment contributes to maintaining the functional independence of patients with osteoporosis and improving their quality of life.

References