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STUDY ON THE DEVELOPMENT OF THERAPEUTIC PROTOCOL IN KNEE ARTHROSIS

Florentina NECHITA[1]

Abstract: *Arthrosis is an irreversible slow degenerative disease, which involves progressive degradation of articular cartilage, associated with progressive remodeling and possibly with minimal or medium synovial inflammation. Regarding the increase in the number of patients with osteoarthritis, the work is based on the detection of new ways of early and systematic application of the procedures and means of recovery by which patients can restore their functional capacity faster, ensuring social and sometimes professional reintegration. The purpose of this work is to present a therapeutic protocol for osteoarthritis of the knee that includes information on patient recovery.*

Key words: *therapeutic protocol, osteoarthritis, kinetoterapy.*

1. Introduction

In recent years, the effects of various motor actions specific to physical education, sports and physical therapy are highlighted, which have a substantial contribution to maintaining the health of the individual, his physical condition.

Systematic physical education and physiotherapy lead to a reduced number of many defects of the organs and systems of the human body, to a proper functioning of muscles, ligaments, the whole human body, protecting it from cardiovascular disease, obesity, stress, thus contributing to a its better functioning.

At the same time, the role of physiotherapy and physical exercises performed with a certain intensity of fun and relaxation in terms of preventing and combating depression, anxiety, stress and in the development of will and self-confidence was shown.

The knee, one of the largest joints of the body, through its position of intermediate joint of the lower limb has a double role:

a) to ensure static through great stability at the moment of support;

b) to ensure the elevation of the foot (its correction according to the unevenness of the ground at the moment of balance); At the same time, it plays an important role in a series of usual moments and activities (sitting on a chair, lifting, lifting an object) or professional activities.

Due to its role in the static and dynamic biomechanics of the lower limb, as well as the poor soft tissue coverage, the knee becomes particularly prone to direct or

[1] Departament of Physical Education and Special Motricity, Transilvania University of Braşov.

indirect trauma, which can later lead to osteoarthritis of the knee.

Osteoarthritis is an irreversible slow degenerative disease that involves progressive degradation of articular cartilage, associated with progressive remodeling, and possibly minimal or moderate synovial inflammation.

This paper contains a predominant idea of making a contribution in order to specify particular aspects of arthritic diseases. This highlights the importance of the elements of functional anatomy that are applied in the recovery of the arthritic joint. All therapeutic disciplines that address the difficult problem of osteoarthritis recovery must compete so that a synchronized team in treatment can be formed. In medical recovery, as a complex medical and social process, physical therapy is a basic therapeutic means. The importance of physical therapy results from its prolongation as the condition progresses.

2. General Notions of the Epidemiology of Osteoarthritis

2.1. Location of osteoarthritis in the knee

Osteoarthritis of the knee is the main cause of gonopathy. It is almost twice as common as hip osteoarthritis and this important frequency is illustrated by the fact that the lesions developed by femur-patellar osteoarthritis are observed in 24% of the population between 60 and 70 years and in more than half of the population over 70 for years [1], [5].

Recent research has shown that the metabolic activity of cartilaginous cells, called chondrocytes, is disrupted. At the same time, in-depth biochemical studies have shown changes in the chemical composition of the fundamental substance of articular cartilage, namely the decrease of proteoglycans. As a result of these disturbances, the cartilage begins to crack, and numerous fibrils detach from its surface; the consequence of these pathological processes is represented by the loss of the characteristic luster and by the thinning of the cartilage [2-3].

Normally, the articular cartilage protects bony extremities, it allows them to slide against each other; In osteoarthritis, this slip is difficult, and due to the loss of surface smoothness, there is a friction that accelerates the erosion of the cartilage, exposing the bone. As a result of cartilage erosions and osteophytic proliferation, there is irritation of nerve threads with a nourishing role, generating pain. The association of an inflammation is not found in order, the pathological processes being purely degenerative and having a chronic, dragging evolution..

"Osteoarthritis (degenerative rheumatism or deforming arthritis) is morpho-pathologically defined by wounds that give back of the articular hyaline cartilage, with interest in the subchondral bone, synovial and soft tissues. From a clinical point of view, it is manifested by pain, deformities and limitation of the movements of the respective joints. especially of the subchondral bone " [7].

Osteoarthritis can affect part or all of the knee joint. They are thus distinguished according to the anatomy of the knee, figure 1:

1_Internal femoral - tibial osteoarthritis, which affects the internal compartment of the knee;

2_External femoral – tibial arthrosis, affecting the external compartment of the knee;

3_Femur-patellar osteoarthritis, which affects the femur-patellar compartment,

between the patella and the femur of the knee;

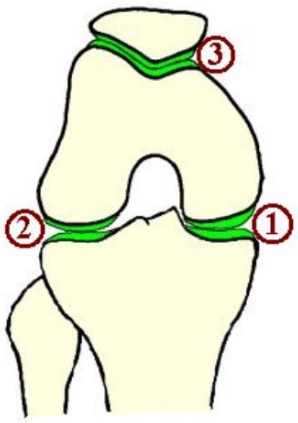

Fig. 1. *Location of osteoarthritis in the knee joint* [8].

2.2. Causes of osteoarthritis

The main causes of arthritic lesions are:

a. Decreased mechanical strength of the articular cartilage;
b. Increased unit pressure in the joint due to capsulo-ligamentary suffering or interarticular elements, muscle dysfunctions, changes in the axes of the femur and tibia.

The causes of osteoarthritis are variable:

- **Axial deviations at the knees**

The axes of the lower limbs can be a favorable factor, being variable from one individual to another, fig.2 .: "valgum genus", with the knees approaching each other, while the ankles move away; "Varum genus", with the knees moving away from each other and the ankles approaching.

The varus, moving the center of gravity of the knees inwards, increases the internal femur-tibial pressure at the knees favoring osteoarthritis at this level. Conversely for the genus valgum [8].

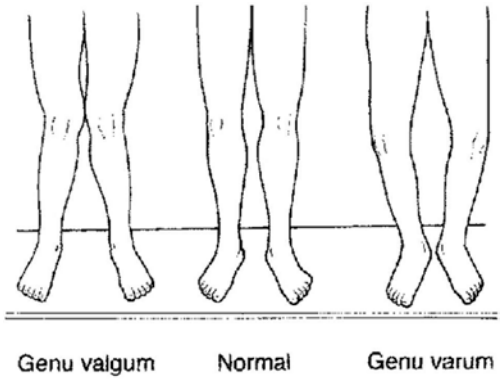

Fig. 2. *Axial deviations of the knees* [9].

- **Overweight**

Excess fat has a biological effect on the joints, making it a contributing factor to osteoarthritis.

Obesity is a general disease that exposes the human body to serious risks of hypertension, diabetes and cardiovascular disease. Thus, an overweight person faces a 4-5 times higher risk of developing osteoarthritis, through a mechanical effect, but also because excess fat has a biological effect on the joints [10].

Obesity is a disease of modern society that associates fears of complications and therefore must be taken seriously and treated [4].

Sedentary lifestyle refers to a lifestyle characterized by lack of movement, static issues and fixation in a stable place. Diseases determined and / or aggravated by sedentary lifestyle: metabolic disorders, obesity, cardiovascular diseases, vertebral deformities, anxiety etc. [6].

- **Knee injuries**

Certain traumas can cause osteoarthritis, such as: Joint fracture of the femur, tibia or patella, Old ligament rupture, particularly rupture of the anterior cruciate ligament, Meniscus injury, especially if the meniscus has been excised, Knee diseases: Knee infections, Rheumatism (rheumatoid

arthritis), Osteonecrosis (localized bone necrosis).

3. Kinetic Intervention Plan Protocol

Knee joint movements performed in transverse and sagittal plane: flexion, extension and laterality. Thus, for flexion there is a counter-pressure on the back of the leg, for extension there is a counter-pressure on the front of the leg - in the first seven days 6 sessions are performed.

The first day isometric contractions of the buttocks and quadriceps, flexion, extension and ankle joint.

-hip flexion at 45%, with the knee extended;

-abduction from the hip at 20%, with the knee extended;

-circumcision with the knee extended (3 sets), 5 weeks, being passive-active movement.

The next day - similar exercises in the supine position to which is added the sitting position (the patient ensures stability by holding on to the chair).

-flexion, extension, abduction movements. The movements are performed with the knee extended (3 sets, 5 repetitions), the active movements (re-education / gaining mobility).

The third day - the same exercises, the same positions, to which are added:

-From sitting on the edge of the bed, the physiotherapist carefully mobilizes the knee joint to the point where the pain begins to appear (starting is done from a flexion of 35 °);

-Passive movement (3 sets-10 repetitions), with a break of one minute between them;

-From lying on his back on the healthy side, abductions, with the knee extended;

-From the supine position, the knee flexion is performed by sliding the heel on the bed plane.

Fourth day - In full, the exercises become active, but the resistance is not applied yet because the patient's muscles have not recovered enough.

-From supine position: the same exercises, here the emphasis is on the active flexion movement of the calf on the thigh (5 sets of 8 repetitions each);

-From sitting at the edge of the bench: active movement, flexion, calf on the thigh and sliding return (skates), back and forth;

-Standing on the trellis: with the face: light lifting with the tips, more support on the unaffected foot, lifting the foot on the first ladder and flexing the leg on the thigh; with back: hip flexion (three 3 series, 6 weeks).

3.1. Functional limitation

Limiting the possibilities of movement and reducing the efficiency at loading are late symptoms and typical of the worst forms; where in such cases the appearance of an articular effusion is relatively frequent, the painful symptomatology being able to acquire the characteristics of the inflammatory forms with pain even in rest. The phenomena of joint blockage (which is observed in meniscal lesions) are missing, at least when it is not a question of very advanced forms in which an detachment of an osteophyte or an osteochondromatosis development can appear.

The functional balance sheet must highlight:

• changes in mobility and stability;

• muscle changes;

• global, functional assessment of the lower limb.

a) Joint balance, figure 3: should highlight

the presence of physiological mobility (flexion, extension, rotations) and reduced mobility, the presence of abnormal movements, balance of neighboring joints (hip - insisting on rotations and extension, ankle and foot).

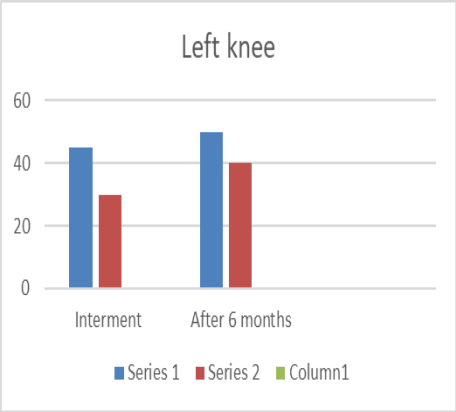

Fig. 3. *Joint balance evolution, left knee*

b) Muscle balance: must analyze the strength of all muscle groups and especially the quadriceps and hamstrings. There will be aspects regarding the painful contractions at the level of the hip (wide fascia tensor, great buttocks, pyramidal muscle, adductors and hamstrings), but also the effectiveness of the rotators to appreciate the balance in the passive movement.

c) Global balance: analyzes the spontaneous attitude, walking, going up and down stairs or other stressful situations in which the dynamics of pain, the availability of hip mobilization in various situations, the degree of stability, unilateral loading and the presence of particular attitudes. Intense pain and muscle failure of the quadriceps promote knee instability and the risk of falling.

4. Discussions

The prognosis of patients with gonarthrosis depends very much on the evolution of the disease before the presentation to the doctor and the start of therapy. If the condition has progressed, there is a risk that the patient's life will be greatly affected by the disease because movements in one of the most important joints of the body are limited. For this reason, specialists recommend that patients consult a doctor if they notice local changes in the joint or if it has become painful and its functionality has been reduced.

Despite important clinical, epidemiological and therapeutic advances in recent years, osteoarthritis has unfortunately not revealed all its secrets. Numerous mysteries remain regarding the knowledge of the natural history of the disease and the determination of its causes, multifactorial and still insufficiently known. [11].

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