

ANALYSIS OF ETHIOPATHIC FACTORS OF GONARTHROSIS AND CHOICE OF KINETOPROPHYLACTIC MEANS

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Abstract Due to the fact that arthrosis is a disease that affects a very large number of people, we felt that presenting some aspects of its pathophysiology and kinetoprophylaxis will be helpful to those working in the field of recovery and beyond. The literature also describes a rather complex clinical picture regarding the processes of degradation and deconditioning of the anatomical joint structures. The presentation of the factors of etiopathogenesis of gonarthrosis and the kinetoprophylactic means of preserving the function of the knee joint is the subject of the study that is intended to be presented. Analysis of the etiopathogenic factors and combating the effects of arthrosis installation through a model of analytical investigation of them, the results obtained from the analysis can be the basis for the realization of a kinetoprophylaxis program.

Introduction

The joint anatomy-physiology and biomechanics of the knee joint is the starting point for the proposed analysis. It is considered that if all the aspects that maintain the integrity and function of the joint are understood, as well as the factors that can destabilise it, we will be able to achieve a postural hygiene and physical activity programme that achieves a balance between the individual's functional capacity and the stresses to which he or she is subjected.

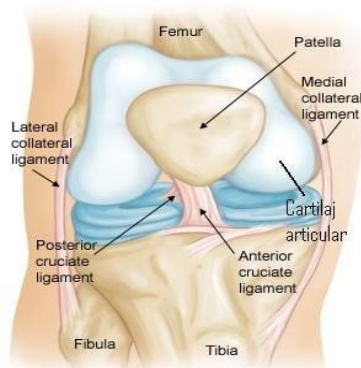


Fig.no.2 knee joint [10]

With regard to the anatomy of the knee joint, we believe that its constituent elements are known, but the aspects that support and maintain the function of this joint are less well presented as elements that work in an interdependent way.

The knee is the joint that connects the thigh to the calf. The bony skeleton is represented by the lower end of the femur, the upper ends of the tibia and fibula and a bone called the patella. There are three joints in the knee region: the femurotibial, femurorotibial and upper tibioperoneal joints. The femurotibial joint is the largest and strongest joint in the body. The articular surface of the distal end of the femur consists of 2 condyles separated by an intercondylar notch and a trochlea

The articular surface of the tibia has 2 glenoid cavities which are covered by hyaline cartilage. Because there is no perfect congruence between the two articulating surfaces, a meniscus has developed between them on each glenoid cavity. The joint capsule, a fibrous sheath and the synovial membrane adhering to the inside of the capsule. The ligamentous system consisting of 6 ligaments together with periarticular musculo-tendinous structures ensure the stability and function of the knee [2,4].

Any damage to the anatomical components of the knee joint in terms of integrity, trophicity and malalignment that modify biomechanics can compromise the stability and functional capacity of the lower limb.

Arthrosis is one of the most common conditions with medico-social implications. The disease affects both sexes equally. Most authors agree that the first tissue injured in osteoarthrosis is the cartilage, which is made up of a basic substance in which a system of collagen fibres (which give the cartilage strength and elasticity) and chondrocytes dispersed in it are found. [6]

Chondrocytes are isolated in the articular cartilage, alone, in collagen pairs or grouped in clusters.

The cartilage is fed by 3 mechanisms: diffusion; pump; and active transfer, feeding occurs in 2 directions: from the synovial fluid and from the subchondral bone. Cartilage tissue recovery is minimal and often non-functional. Following traumatic injury, cartilage recovery is fibrotic or cicatricial.

The senescence process also contributes to the morphofunctional degradation of articular cartilage. [1] The initial lesion in arthritic disease is at the level of the cartilage which shows erosions or fissures that gradually develop into ulcerations, this clinical picture is accompanied by a subchondral bone condensation, the appearance of microgyrids, cartilage calcifications and osteophytes. [6]

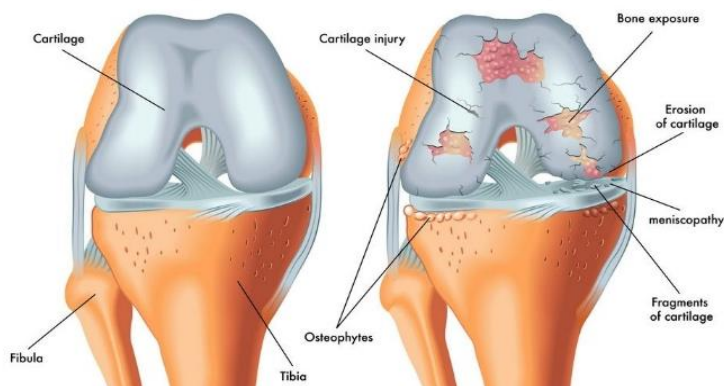


Fig.no.2 gonarthrosis [9]

Gonarthrosis is the most common arthrosis to occur and is the location of degenerative rheumatism in the knee. [3] Gonarthrosis can be primitive and is established after 50 years of age, predominantly in females (endocrine factors, obesity, venous disorders). Secondary gonarthrosis is due to biomechanical disorders of the knee of traumatic origin (fractures, dislocations, meniscus ruptures, ligament, etc.), static (genuvarum, valgum, flatfoot, coxarthrosis), other pathologies at the level of the knee.

Etiopathogenesis: affects middle-aged and older people. Occurs after 40-50 years of age and affects both sexes equally. The presence of arthritic disease can be affirmed only in the presence of characteristic clinical manifestations.

Besides the ageing factor there are other factors involved, these are:

- genetic factors - occurs in people whose family has a predisposition to weak joints;
- age and gender - the risk of developing gonarthrosis increases with age and, although it is more common in women, many men also suffer from gonarthrosis due to joint overuse;
- mechanical factors leading to zonal overstrain through overpressure points in the large weight-bearing joints (obesity which puts stress on the hip and knee joints);
- traumatic factors-single trauma leading to cartilage destruction and cicatricial remodelling; repeated microtrauma;
- endocrine and metabolic factors-intervention as in acromegaly causing cartilage destruction;
- chronic inflammatory factors-chronic inflammation forces deterioration and slows cartilage remodelling.

Clinical aspects: onset is insidious, slow, with the main symptom being pain after prolonged walking on flat ground (over time it becomes persistent). Intensification of pain is suggestive of gonarthrosis and occurs in positions of high knee flexion. [5]

Location of pain: at the joint interline on the inner aspect of the knee or anterior aspect below the kneecap, irradiation is towards the calf. The pain is mechanical and over time causes a functional deficit of the knee which manifests itself in 3 aspects:

- instability: non-specific hypermobility caused by insufficiency of joint structures giving passive instability. There is also active instability caused by muscle insufficiency correctable by kinetic exercises.
- limitation of joint mobility: kinetotherapy is performed in the case of soft tissue disorders;
- pathological mobility (hypermobility): hyperextension or exaggerated sideways movement.

Cracking due to cartilage destruction; patellar shock (in activated arthroses); enlargement of the knee. The presence of varicose veins as a particular sign is intensified.

Paraclinical investigations: Normal VSH; synovial fluid-transudate appearance.

Radiological examination (front and profile for both patellofemoral and patellofemoral joints): joint interline narrowing; osteophytes at patellar heads (tibial plateau); osteosclerosis of bone (dark bands in areas of overpressure); osteoporosis.

Differential diagnosis:

- coxarthrosis with knee pain;
- arthritis of the knee-presents inflammatory type pain, knee will be red and warm (RA, peripheral onset SA, TB arthritis, gout);
- meniscus lesion (internal)-pain is also on medial aspect of knee; differentiation is by calf rotation and orthopedic (running block) [8].

Progression: slowly progressive, ankylosis rarely occurs. There are 4 evolutionary stages:

- latent arthrosis stage (primitive gonarthrosis without clinical signs): pre-arthritic state;
- the clinically manifest stage (initial gonarthrosis);
- activated arthrosis stage (hypersecretion of synovial fluid, deformity of the knee);

- decompensated arthrosis stage (joint axis deviations, deformities compromising mobility and stability).

Aim and objectives of the study:

The aim of the study is to present the analysis of the etiopagenetic factors of gonarthrosis installation and the choice of kinetoprophylactic means

Research objectives:

- literature review on the kinetoprophylactic approach to gonarthrosis;
- to develop a specific kinetoprophylactic working model for the management of the arthritic process in the knee joint.

Materials and methods:

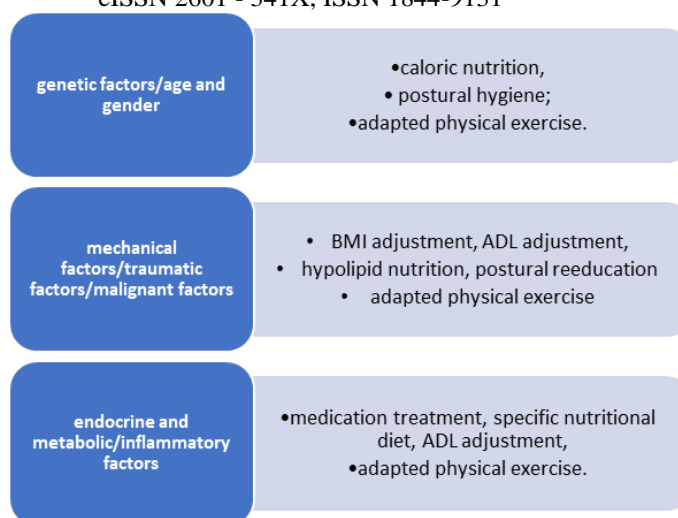
In order to achieve the proposed working model in the approaches that we will carry out, we start from the premise that we have a subject in the category of those who are predisposed to arthritic disease and in particular at the level of the knee, namely gonarthrosis. The clinical picture will include clinical and paraclinical investigations.

The assessment of the subject will start with the anamnesis or discussion with the patient, which will collect personal data about the health history. The objective examination is always done comparatively, with the patient in orthostatic and decubitus, static and dynamic. Inspection of the knee allows assessment of morphology: patella; tendon relief; muscle prominences; anterior tibial tuberosities; partial or global tumefactions; changes in the colour of the skin. Also in this context, malalignments can be observed in the lower limbs (genuvar, genuvalg, or inequalities). By palpation, the following can be observed: temperature, femoral-tibial joint interline, lateral ligament trajectories, muscle tendon insertion area, tone and trophicity of the thigh and calf muscles, popliteal area, pain topography, paresthesia areas, blood circulation. Then joint assessment, muscle testing, static and dynamic balance testing and functional gait assessment are performed. Finally, biological examination, radiological examination, synovial fluid examination and arthroscopy will be performed if necessary. [7]

Following the completion of these steps, the subject's functional residual is extracted.

In order to understand the mechanisms of installation of the arthritic process we will make a table with factors that can develop the installation of this pathogenesis and means of prevention.

Table no. 1 model



Results and discussions:

With regard to the requirements in Table no.1, the following aspects can be distinguished: Medical control, clinical and paraclinical investigations are mandatory in order to determine the functional status. Treatment of all medical problems as far as possible and establishment of a lifestyle adapted to the requirements. Nutrition and medication to support the effort to stabilise health status. Adaptation of ADLs according to capacity and approach to specific postural hygiene. Adapted kinetoprophylactic exercise aimed at maintaining/increasing trophicity, joint mobility, muscle tone and of course proprioceptive capacity in static and dynamic, and where appropriate postural/gait re-education.

Conclusions:

- Any deviation from the anatomical-physiological parameters of the knee joint in terms of integrity, trophicity and malalignment that modify biomechanics can compromise the stability and functional capacity of the lower limb;
- Gonarthrosis is the most common arthrosis that occurs and represents the location of degenerative rheumatism in the knee;
- In the arthrotic process, cartilage tissue recovery is minimal and often non-functional;
- Following traumatic injuries, cartilage recovery is fibrotic or cicatricial; the senescence process also contributes to the morphofunctional degradation of articular cartilage;
- Understanding the mechanisms of arthritic disease is the first step in combating it.

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