

# NEW APPROACHES IN THE ORTOBIOLOGICAL THERAPY

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## Abstract

Osteoarthritis is the most frequently reported and the most onerous disease in middle-aged and elderly people. Degenerative changes constitute a heterogeneous set of pathological transformations of the structure and function of the elements forming the joint, which is the result of factors disturbing their balance. The loss of joint cartilage mass with its insufficient rebuilding or transformation of subchondral bone and other soft tissue structures is characteristic for this disease [1-3].

Nowadays, in addition to the development of invasive surgical methods aimed at cartilage reconstruction, it is possible to use ortobiological therapy in parallel, taking into account the careful qualification for this type of treatment. Ortobiological therapies use the vital potential of the unique tissue that is blood. The expected effects of ortobiological treatment in osteoarthritis is joint cartilage regeneration and acceleration of healing [1,2,4].

The effectiveness of each therapy depends on a number of factors that affect its results not only during or after its application, but also before the start of treatment. Therefore, it is important to properly prepare the tissues for the planned therapy. Targeted physical activity, taking into account the correctness of its performance is extremely important in the preparation of the tissue base for the application of autologous preparations. Physical exercises, preceding the application of injection within the musculoskeletal system, improve the effectiveness of ortobiological treatment. The combination of ortobiological therapy and subsequent physiotherapy support the rehabilitation process, leading to the achievement of the best possible end results [5-7].

The platelet rich plasma (PRP) is a more and more commonly used method of ortobiological therapy. Platelet rich plasma is a source of growth factors that is used to improve the function of tissues by remodeling their morphology and improving metabolism. This therapy distinguishes itself from conventional means of influencing tissue and contributes to establishing a new therapeutic direction in the treatment of osteoarthritis [8]. Another therapy used in ortobiology is autologous conditioned serum (Orthokine®). This modern method of treating inflammation and degenerative joints strengthen the integrity of joint cartilage by introducing anti-inflammatory cytokines into the body. In addition, a significant increase in the concentration of growth factors during conditioning using Orthokine® has been demonstrated. These factors stimulate tissue repair and regeneration processes by migrating cells to the site of damage, their multiplication, differentiation and the formation of new blood vessels [9-11].

One of the methods used to treat osteoarthritis is stem cell therapy. The purpose of these cells is to replace the dead cells and rebuild the tissue. Due to the fact that stem cells present in the human body, as the body ages, they lose their ability to intensively regenerate, the method of stem cell proliferation is used for therapeutic purposes. Properly prepared stem cells are injected precisely to the affected area. Stem cell therapy is a method that is constantly improved both in the selection of the source of cells and the method of their preparation

in order to isolate and concentrate the cells. The research carried out in this direction is aimed at optimizing the therapy and, consequently, effective assistance to patients with osteoarthritis [12].

An important problem associated with osteoarthritis is the occurrence of degenerative cysts. They appear due to the formation of bloody strokes and the conduct of destructive processes in the subchondral bone. Ongoing work on surgical methods to prevent the rapid progression of the disease. Currently, tissue scaffolds are used to fill defects. These are the resorbable material that fills the tissue defect, and through their structure they allow for the migration of cells and overgrowth of tissues, and thus its reconstruction [13-15].

In order to improve the properties of materials, research is conducted on hybrid implants that would combine individual therapies. The possibility of comprehensive treatment, consisting in filling cavities with an implant, with the use of an ortobiological preparation in the scaffolding space, will allow bone tissue remodeling to proceed under optimal conditions [16].

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