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OSTEOARTHRITIS: IMPACT ON FUNCTIONAL CAPABILITIES AND REHABILITATION STRATEGIES

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Abstract
Osteoarthritis is a chronic degenerative joint disease that is common among older people. The article discusses the pathogenetic mechanisms of osteoarthritis, its impact on the functional capabilities of patients, and modern rehabilitation strategies. Particular attention is paid to exercise therapy, physiotherapy, drug therapy, and psychoemotional support as key components of comprehensive disease management. A systematic approach to improving the quality of life of patients and reducing the degree of disability is presented.

Keywords: Osteoarthritis; functional limitations; rehabilitation; chronic pain; physical therapy; disability; quality of life.

Introduction

Osteoarthritis (OA) is one of the most common chronic degenerative joint diseases, especially among older people. According to the World Health Organization, more than 10% of the population over 60 years of age suffer from various forms of osteoarthritis , with the knee and hip joints being most often involved (WHO, 2021). The disease is characterized by the progressive destruction of articular cartilage, subchondral sclerosis , osteophytosis and inflammatory changes in the surrounding tissues, which leads to pain, limited movement and a decrease in the quality of life of patients (Litvinova T.A., 2020).

Of particular relevance is the study of the impact of osteoarthritis on functional capabilities - the patient's ability to perform everyday activities, maintain mobility and independence. Along with this, the effectiveness and timeliness of the applied rehabilitation strategies directly determine the prognosis of the disease, the degree of disability and return to social activity.

The purpose of this article is to analyze the clinical manifestations of osteoarthritis , their impact on the functional state of patients, as well as to substantiate modern approaches to rehabilitation as a key element in the complex treatment of the disease.

Main Part

Osteoarthritis is a chronic degenerative-dystrophic disease of the joints, which mainly affects the hyaline cartilage, and in the later stages, the underlying bone, synovial membrane, capsule and

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surrounding muscles are also involved. The pathogenesis is based on the imbalance between the processes of destruction and restoration of articular cartilage. In this case, degenerative changes are initiated under the influence of mechanical overloads, age-related changes, microtraumas, obesity, as well as a number of metabolic and endocrine disorders. A special role is played by inflammatory processes mediated by proinflammatory cytokines, including interleukin-1β, tumor necrosis factor alpha (TNF-α), and matrix metalloproteinases , which leads to accelerated degradation of type II collagen and aggrecan - key components of the intercellular matrix of cartilage tissue.

From a clinical point of view, osteoarthritis develops gradually, often gradually, and in the early stages it manifests itself as episodic pain in the affected joint during physical activity. The pain is mechanical in nature and disappears at rest, which distinguishes it from inflammatory arthritis. Over time, the intensity of the pain syndrome increases, and the joint becomes stiff. Patients note stiffness of movement, especially in the morning, increasing crunching when moving, as well as a feeling of instability of the joint. In more severe stages, joint deformations, contractures and muscle atrophy develop due to physical inactivity.

Table 1. The most frequently used methods of rehabilitation for osteoarthritis and their therapeutic effect

Rehabilitation method	Purpose of application	Therapeutic effect
Therapeutic physical training (LFK)	Strengthening muscles, restoring movement	Reduced pain, increased mobility
Magnetic therapy	Improving microcirculation	Reducing inflammation and swelling
Massage and manual therapy	Relieving spasms, improving blood circulation	Improvement of tissue trophism, muscle relaxation
Diet therapy	Weight loss, metabolic correction	Reduced stress on joints
Psychological support	Increasing motivation for treatment	Reduced anxiety, increased compliance

The functional capabilities of patients with osteoarthritis are significantly reduced. Gait is impaired, the distance of independent movement is reduced, climbing stairs, getting up from a chair and performing everyday activities that require bending the limbs are difficult. All this leads to a limitation of self-care and the need for outside assistance, especially in the elderly. Functional assessment is carried out using clinical scales such as WOMAC, Lequesne Index , as well as using simple tests such as the "Get Up and Go Test" or the 6-minute walk test. Studies have shown that the WOMAC index in patients with grade III osteoarthritis can exceed 70 points, which corresponds to a severe degree of functional activity limitation.

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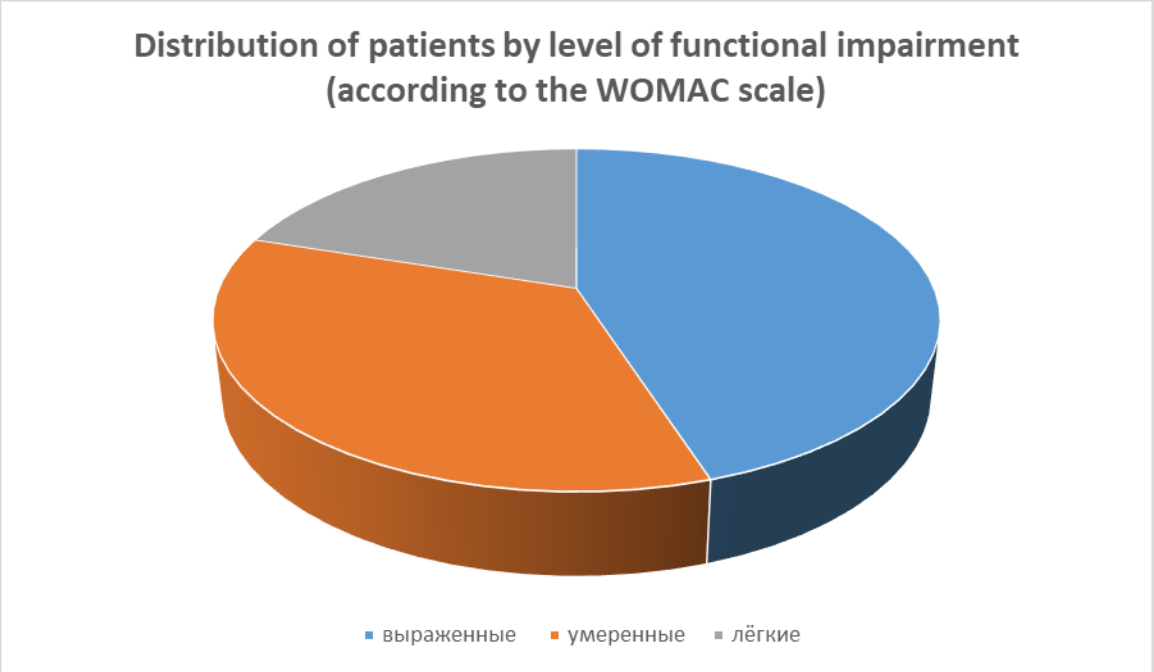

Diagram 1. Distribution of patients by level of functional impairment (according to the WOMAC scale)

Explanation: The diagram shows that about 45% of patients with osteoarthritis have severe functional limitations (WOMAC > 70 points), 35% have moderate, and only 20% have mild manifestations of the disease. This emphasizes the need for early intervention and an active rehabilitation program.

In addition to physical difficulties, osteoarthritis has a significant impact on the psycho-emotional state of patients. Chronic pain and limited mobility are often accompanied by depression, anxiety and social isolation. This is especially pronounced in older people, who often have osteoarthritis combined with other chronic diseases, such as hypertension, diabetes or osteoporosis. Thus, osteoarthritis is not only an orthopedic problem, but also a multidisciplinary one, requiring a comprehensive approach to treatment and rehabilitation.

Rehabilitation approaches and modern strategies for the treatment of osteoarthritis

Treatment of osteoarthritis is a multi-stage process aimed at eliminating pain, improving joint function, slowing the progression of degenerative changes and improving the patient's quality of life. Modern approaches to treatment include drug therapy, physiotherapy, exercise therapy, diet therapy, psychoemotional support and, if necessary, surgery. However, rehabilitation occupies a special place as an integral part of comprehensive patient management.

In the early stages of the disease, priority is given to non-drug methods. The key role is played by therapeutic physical training (LFK), aimed at strengthening the periarticular muscles, restoring the range of motion and improving posture. An individually selected set of exercises should be performed regularly, under the supervision of a rehabilitation physician . According to the recommendations of the European Society for the Study of Osteoarthritis (EULAR, 2019), moderate aerobic exercise and isometric exercises are the most effective for patients with knee osteoarthritis .

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Physiotherapeutic methods also play an important role in the rehabilitation process. Ultrasound therapy, magnetic therapy , laser therapy, low-frequency currents (LFC), paraffin therapy and mud therapy are used. These procedures help reduce inflammation, swelling and pain, and activate metabolic processes in the joint tissues.

Drug therapy is aimed at relieving pain and improving mobility. The most commonly used are nonsteroidal anti-inflammatory drugs (NSAIDs), chondroprotectors (glucosamine, chondroitin sulfate), and local injections of hyaluronic acid or corticosteroids into the joint cavity. However, long-term use of NSAIDs requires caution due to the risk of side effects, especially in elderly patients.

An important aspect of rehabilitation is body weight correction, as excess weight significantly increases the mechanical load on joints, especially knee and hip joints. Diet therapy should be aimed at weight loss while maintaining a balanced diet rich in proteins, omega-3 fatty acids and antioxidants.

Psychological support and behavioral therapy are also part of comprehensive rehabilitation. Chronic pain syndrome and decreased motor activity can lead to depression, anxiety, and social isolation. Individual and group counseling, participation in patient schools, training in self-help methods and adherence to the regimen significantly improve compliance and overall prognosis.

In cases of severe deformation and complete loss of joint function, the possibility of surgical treatment - arthroplasty - is considered. However, even after surgery, rehabilitation remains a critical stage in restoring function, including early mobilization, kinesiotherapy and pain control.

Thus, modern strategies of rehabilitation in osteoarthrosis require an interdisciplinary approach and active participation of the patient. Complexity, stage-by-stage and individualization of measures allow achieving better functional results and preventing the progression of disability.

Conclusion

Osteoarthritis is one of the most significant diseases of the musculoskeletal system, which has a serious impact on the functional capabilities of a person, especially in old age. It is accompanied by progressive pain, limited mobility and a decrease in the quality of life, which together lead to disability and social maladaptation . As shown in this review, the pathogenesis of osteoarthritis is multifactorial and includes mechanical, metabolic and inflammatory components. This requires a comprehensive approach to diagnosis, treatment and rehabilitation of the patient from a specialist. Particular attention should be paid not only to pain relief, but also to the restoration of motor activity and patient independence. Modern treatment strategies are based on the principles of interdisciplinary interaction and include drug therapy, physiotherapy procedures, exercise therapy, lifestyle correction and psycho-emotional support. At the same time, rehabilitation measures occupy a central place in the restoration of the functional state and improvement of the prognosis. Thus, osteoarthritis requires early detection, an individualized treatment plan and systematic rehabilitation. Only with the active participation of the patient and a comprehensive approach of specialists is it possible to achieve stable remission, maintain mobility and ensure a decent quality of life even in the late stages of the disease.

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