

Functional Indicators in Evaluation of Effectiveness of Caripain Treatment of Gonoarthrosis with Electrophoresis

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Abstract This article provides data on the effectiveness of physiotherapeutic procedures, in particular, the use of caripain with the method of drug electrophoresis in the treatment of osteoarthritis.

Keywords Osteoarthritis, Knee joint, Chondroitin sulfate, Rehabilitation, Osteophyte, Synovitis, Disability, Quality of life

1. Introduction

According to modern concepts, osteoarthritis belongs to a group of diseases of different etiology, which are characterized by a chronic course of biological, morphological and clinical changes, and the pathological process affects all components of the joint, mainly the uncle, subchondral bone, synovial membrane, connective tissue, joint capsule, interacts with degenerative-dystrophic processes in articular muscles [1,5,6].

Risk factors for the occurrence of osteoarthritis are: 1) genetic: type 2 - hereditary collagen disorder, type 2 - collagen mutation, other hereditary bone and joint pathologies, ethnic origin of man; 2) non-genetic: old age, overweight, menopause, developmental disorders (hip dysplasia) or acquired diseases of the bones and joints, surgical interventions on the joints (removal of the meniscus, etc.); 3) environmental factors: work-related physical activity, various injuries to the joints, active recreation and (or) sports [5,9,12].

Among such diseases, gonarthrosis occurs in every 5 people on earth, and its frequency in women is 2 times higher than in men [9]. In the first stage of the disease, periodic pains are characterized by low intensity, especially after sleep and prolonged sitting - "initial" pains appear. In the second stage, the pain is added after a long stay in the legs and walking. Limitation of movement in the joints, increased muscle malnutrition, the patient carefully presses his foot due to pain during walking. In the third stage, flexion of the legs (X-shaped or O-shaped) develops. Deformed joints

swell as a result of swelling. As a result, movements are significantly limited or completely lost [4,9].

Low quality of life indicators have been found in patients with osteoarthritis, especially those with gonarthrosis, which is associated with a chronic, progressive course of the disease. Given the age of the patients, progressive joint injuries, we can say that the disease has a negative impact on the most important functions of the patient - physical, psychological, social activity. The study of quality of life allows monitoring the condition of patients, assessing the dynamics and effectiveness of treatment. Measurement scales, in particular the WOMAC index and the Leken index, are used to assess the specific characteristics and limitations of knee joint function [4,7,12,13].

According to the literature, despite the complex treatment of osteoarthritis with non-steroidal anti-inflammatory drugs and chondroprotectors, it is not effective enough. Therefore, depending on the pathogenetic link of osteoarthritis, it is necessary to study the complex restorative treatment methods of this disease.

2. The Purpose of the Work

The main goal of our research is to study the dynamics of knee joint function in patients with gonarthrosis, mainly in the first and second stages, to assess the effectiveness of treatment with Karipain using electrophoresis using clinical tests and the WOMAC index.

3. Materials and Methods

Bukhara Regional Multidisciplinary Medical Center was conducted in the physiotherapy and traumatology departments of 60 patients (36 in group 1; 24 in group 2)

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Received: Nov. 17, 2021; Accepted: Nov. 29, 2021; Published: Dec. 15, 2021

Published online at <http://journal.sapub.org/ajmms>

divided into two groups of 35 to 74 years of age with the first and second stages of osteoarthritis according to Kellgren-Lawrence. Patients in group 1 received electrophoresis with caripain, and patients in group 2 received electrophoresis with lidocaine. Treatment efficacy was assessed by changes in the WOMAC index, functional Leken index, pain on VAS, i.e. while walking, at rest, goniometry data, 30 m straight line walking, and stair climbing time.

The Leken index for gonarthrosis, as well as the WOMAC index, along with a clinical examination to assess the effectiveness of treatment, range from 0 to 100 mm on the VAS, time to climb stairs 10 steps (sec), and walking in a straight line at a distance of 30 m (sec). pain in the joint was taken into account. The size of the knee joints was measured using a measuring tape in the middle third of the joint, the range of motion in the knee joints according to goniometry data, the swelling of the joints in points (0 to 2 points), and the pain observed on palpation in the direction of the fracture.

Depending on the treatment, patients were divided into 2 groups: first (n = 36 people), second (n = 24 people), age and sex composition, disease duration, radiological changes of the joints, and functional disorders were compared. The first group of patients underwent electrophoresis with Karipain. 1 vial of the drug was dissolved in 10 ml of saline before treatment, placed on a filter paper placed on the electrode of the positive pole and placed on the painful area of the knee joint. On the electrode of the negative pole was placed a filter paper containing 2.4% euphyllin and placed parallel to the first electrode. In the second group of patients, electrophoresis was applied to the positive pole with 2% lidocaine, and the negative pole was placed parallel to the positive pole without any drugs. In both groups of patients, the treatments were set at 15-20 minutes, frequency 100 Gts, a value between 12-15 mA, depending on the patient's mood. Relying solely on the patient's emotions, the flow should be increased smoothly. The pads should be firmly placed on the patient's body to prevent skin burns. Electrophoresis was performed daily and regularly. The number of courses was conducted depending on the severity of the disease (usually 2-3 courses). One course of treatment consisted of 10-12 treatments.

Statistical analyzes were performed using a computer program. The Student t-criterion was assessed.

4. The Results Obtained

The clinical characteristics of the patients are presented in Table 1, which shows that the majority of patients (69.4%) are women over 45 years of age. The majority of patients are in the 55- to 64-year-old group. The average age was 54.5. The duration of the disease ranged from 6 months to 15 years, and the mean duration of attacks was 5.9 ± 1.1 weeks. In the majority of patients, i.e. 44.5%, stage II was detected by radiography (Kellgren-Lawrence).

Clinical description of patients

Clinical information	Main Group		Comparative group	
	N	%	N	%
The number of patients	36	100	24	100
Gender				
Male	11	30,6	7	29,2
Female	25	69,4	17	70,8
Age				
35-44	1	2,8	1	4,2
45-54	12	33,3	10	41,7
55-64	16	44,5	8	33,3
65-74	7	19,4	5	20,8
Duration of gonarthrosis				
Up to 1 year	6	16,7	3	12,5
1-5 years	21	58,3	9	37,5
Up to 6-10 years	7	19,4	5	20,8
More than 10 years	2	5,6	7	29,2
Radiography				
I	7	19,4	9	37,5
II	16	44,5	13	54,2
III	13	36,1	2	8,3
Functional disorders in the joint, degree				
I	7	19,4	7	29,2
II	23	63,9	14	58,3
III	6	16,7	3	12,5

Functional impairment in the joint was grade II 63.9%. Clinical signs of synovitis and tendinitis were detected in 47 patients (78.3%).

Patients showed limited range of motion (84%) in the affected knee joints. Pain syndrome during movement on the VAS ranged from 40 to 100 mm (82.24 ± 2.58 mm and 61.8 ± 2.4 mm) in the main and comparison groups, respectively. The values of the Leken functional index ranged from 4 to 16 points, ie 15.1 ± 0.6 and 15.2 ± 0.8 points, respectively.

Prior to treatment, the severity of pain in both groups of patients did not differ clinically and radiologically, however, in group I patients, the pain was high on the VAS in motion ($p < 0.01$). From 1 month of treatment, a decrease in pain and other clinical signs of the disease began to be observed in both groups of patients, but in group I the indications were significantly higher. Thus, in this group of patients at rest on the VAS, a significant decrease in pain during movement was observed, functional tests improved (walking in a straight line 30 m, climbing stairs, bending the knee joint) ($p < 0.01$), while patients in group II only said pain was significantly reduced at rest.

In both groups, the dynamics improved significantly after two and three months, but in group I, improvement in all clinical parameters occurred more rapidly. Thus, electrophoresis treatment with the drug caripain showed a significant reduction in pain, Leken index, improvement of functional tests at 8 weeks of treatment. Even after 12-13 weeks, this trend continued. In group II, significant

improvement was observed after 8–10 weeks in most clinical trials. A functional statistically significant improvement was noted after 12 weeks of treatment. ($p < 0.01$). As a result of these treatments, after 12 weeks, complete disappearance of pain was observed in 87% and 74% of patients at rest, during movement - in 82% and 70%, swelling of joints - in 94% and 75% of patients (in groups I and II, respectively). Laboratory parameters improved in these patients.

Prior to treatment, the functional status of the knee joint on the WOMAC index scale did not differ significantly in both groups: group I - 52.2 ± 0.6 mm; Group II - 46.0 ± 0.5 . Electrophoresis treatment with Caripain resulted in a significant improvement in joint function compared to electrophoresis with lidocaine. For signs of "climbing or descending stairs", "bending to the floor", "heavy work at home", the severity of pain was the highest - from 60 to 100 mm.

Restrictions on movement in patients are required in cases where multiple mobility and stable balance are required, especially when entering or exiting a vehicle, when getting out of bed (57 to 72 mm), (54.3 ± 0.5 mm and 51.6 , respectively, in groups) $\pm 0, 6$ mm) was felt. In general, during treatment of both groups of patients, a significant improvement ($r < 0.05$) in the mobility of the affected joints on all 17 points of the WOMAC scale was observed within 3 months, especially in patients in group 1 compared with patients in group 2. was found to be giving good results. No side effects were observed during treatment.

5. Conclusions

Treatment of osteoarthritis is a topical issue among diseases of the musculoskeletal system. Nonsteroidal anti-inflammatory drugs are often used to treat this disease, which, along with relieving pain and improving joint mobility, have side effects primarily on the gastrointestinal tract, especially in elderly patients. In this regard, a pathogenetically based, almost no side effects, high-efficiency treatment method with selective effect on the structure of the uncle was chosen for the disease. This type of therapy allows to reduce the pain syndrome, restore the patient's mobility, that is, a normal lifestyle, improve its quality. The study of the effectiveness of different methods of treatment of osteoarthritis includes the use of subjective assessments of the patient as a criterion, according to which the dynamics of pain sensations were determined. The general effect on the pathological process was determined. In our study, data were obtained confirming the effectiveness of local effects of electrophoresis treatment on the joints with the drug caripain in terms of its effect on pain syndrome and Leken index. The drug has a positive effect on motor activity, the state of muscle tone, the altered structure of bone tissue. The use of Karipain by electrophoresis is effective because this treatment allowed the active ingredients of the drug to be delivered directly to the depth of the damaged tissue.

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