Volume 3, Issue 1, January 2025 ISSN (E): 2938-3765

# EARLY KNEE OSTEOARTHRITIS, DIAGNOSIS CRITERIA AND COMPLEX TREATMENT

Abdurazzakova D. S.
Matchanov S. X.
Tashkent Medical Academy, Tashkent

**Abstract**
The prevalence of chronic joint diseases, among which osteoarthritis (OA) predominates, continues to grow rapidly throughout the world. Until now, most patients begin to receive adequate treatment only at the stage of organ failure of the joint, when it is no longer possible to significantly slow down the progression of the pathological process. This reduces the effectiveness of the therapy. Early OA is one of the least studied problems. The article discusses the problem of timely detection and comprehensive treatment of early OA

**Keywords**: Early osteoarthritis, comorbid conditions, early diagnosis.

## Introduction

Osteoarthritis (OA) is a joint disease characterized by cell stress and extracellular matrix degradation, which develops due to macro- and micro-injuries, leads to activation of pathological adaptive-restorative reactions and inflammatory pathways of the immune system [1, 2, 3] .

Modern concepts of OA include an interdependent process in joint structure that begins at the molecular level and progresses to cellular stress and gradually leads to cartilage degradation, subchondral bone remodeling, pathological repair - osteophytosis, inflammatory reaction, and joint functional failure due to tendon and subchondral bone damage and also leads to muscle hypotrophy [4, 8, 11] .

Although OA does not threaten the patient's life, it can lead to deterioration of their quality of life, temporary and permanent impairment of working capacity, exacerbation of comorbid conditions, and as a result, an increase in overall mortality rates. In 2016, the International Osteoarthritis Research Society (OARSI) and the United States Food and Drug Administration (FDA) together recognized OA as a serious disease [5, 12 ].

The perception of OA has changed significantly in recent years. OA is no longer considered as a degenerative disease but an inflammatory disease [6, 9, 10] . In addition, there are a number of objective and subjective problems in the treatment of OA to date. The most important of these is that patients turn to the doctor late. According to data, only 1% of patients in the first stage of the disease, 18% in the second stage, and 81% in the third stage turn to a doctor [7, 10, 13] . It can be seen that the majority of patients do not consult a doctor in the early stages of the disease, when the possibility of effective treatment is high. In the early stages of the disease, the pain in the joints of patients does not have a permanent character, the pain occurs only during physical exertion and can pass without medication. Often, patients turn to doctors in the third stage of the disease, when the effectiveness of treatment is limited . From the above points, it should be concluded that the



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

early diagnosis and early treatment of osteoarthritis will greatly help to prevent the complications of the disease.

The objects of the study is to develop complex treatment methods for patients with early osteoarthritis, using diagnostic criteria.

Materials and styles. The research was carried out in the arthrological specialized outpatient course treatment center, rheumatology and cardiorheumatology departments of the multidisciplinary clinic of the Tashkent Medical Academy.

The diagnostic criteria adopted and revised by the American College of Rheumatology (ACR) in 2016 were used to diagnosis (Table 1).

Table 1 Criteria for early osteoarthritis of the knee, revised (ACR 2016)

| Criteria | Ball |
|---|---|
| Mechanical pain in the knee joint | 1 |
| Discomfort in the knee joint | 1 |
| Cramping in the knee joint on movement | 1 |
| Absence inflammation signs in siovial fluid | 2 |
| 40 years < onset ≤ 50 years | 1 |
| onset >50 years | 2 |
| Bone growth ( knee bony enlargement) | 1 |
| Detection of osteophytes on X-ray or MRI | 2 |

Note: the diagnosis is definite when there are at least 3 points.

41 patients with early osteoarthritis with disease duration up to 6 months (average 4.3 ±1.4 months) were included in the study .

Clinical characteristics of patients are presented in Table 2.

Table 2. Clinical characteristics of patients

| Parameters | Patient group ( n=41) |
|---|---|
| Gender, n (%) | Men 14 (34.1%)<br>Women 27 (65.9%) |
| Age, years (M ±SD) | 48.9 ±11.8 |
| Disease duration, months (M ±SD) | 4.3 ±1.4 |
| Body mass index (BMI), kg/m $^2$ (M ±SD) | 27.4 ±2.9 |
| X-ray stage according to Kellgren, n (%)<br>I<br>II | <br>26 (63.5%)<br>15 (36.5%) |
| VAS pain, mm (M ±SD) | 28.4 ±9.8 |
| Index WOMAC, score (M ±SD) | 31.6 ±10.4 |
| Index Leken, score (M ±SD) | 7.9 ±3.1 |
| Metabolic syndrome, n (%) | 25 (60.9%) |
| Ischemic heart disease | 6 (14.6) |
| Diabetes, n (%) | 3 (7.3%) |
| Hypertensive disease, n (%) | 8 (19.5) |



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

According to the clinical characteristics of the patients, it was found that the average body mass index (BMI) of the patients was higher than the norm, which is a risk factor for the development of OA.

Patients were divided into two groups according to treatment methods. Group 1 (control group) 18 patients received conventional therapy (nonsteroidal anti-inflammatory drugs meloxicam 15 mg per day, chondroitin sulfate 800 mg per day as a chondroprotective agent), group 2 (main group) 23 patients received conventional therapy (nonsteroidal anti-inflammatory 15 mg of meloxicam per day, chondroitin sulfate as a chondroprotective agent 800 mg per day) along with rehabilitation methods.

In our research, we developed complex rehabilitation methods for patients with OA depending on the pathogenetic joint. In it, taking into account the patient's objective and subjective symptoms, sex, age, severity of the disease, radiological symptoms, rehabilitation treatment methods were recommended. Evaluation of the time course of values describing the effectiveness of the developed rehabilitation treatment scheme for patients with early OA was carried out at each follow-up stage, 3, 6 months after the end of the course of therapy.

The following were used as rehabilitation exercises.

1. Walking in the fresh air (on 2 Scandinavian sticks). Such a walk is one of the simplest and most effective methods for the health of not only the joints, but also the whole body. It improves lung and heart function.

One of the comorbidities in the studied patients with early OA was obesity. This is one of the main pathogenetic factors of OA. Patients are advised to walk at a normal pace for 40 minutes every day. This is not only an integral part of the treatment of OA, but also prevents obesity.

2. Therapeutic physical exercises .

The main principle that the patient should follow when performing therapeutic exercises is the regularity and gradualness of the exercises.

Exercise 1. (Butterfly position).

Initial state. Patient is sitting on the floor, the back area is straightened, and the legs are stretched forward.

Step by step the knees are bent and the heel is pulled towards the calf.

Both palms are brought together and the outer side of the heel is on the ground.

The hip is move down to the ground.

Then the legs move like the wings of a butterfly.

First of all, it stretches and strengthens the leg muscles, and increases the range of motion in the hip joint .

Exercise 2.

Initial state. In the supine position, the knees are bent to the hips without leaving the heels off the floor.

Then, bending at the hip joint, holding it with the hand, it pulled to the abdomen and held in this position for 10 seconds.

Then the legs moved down and gradually straightened. This exercise is repeated up to 10-15 times.

Exercise 3.

Initial state . The legs are bent up to the knees and raised up. It is done like riding a bicycle.



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Exercise 4.

Initial state. While sitting on the floor, the legs are straight. Without bending the knees, the arms are stretched up to the heel area. Patients have to stand in this bent position for 10 seconds. The exercise is repeated from 5 to 8 times.

When we analyzed the patients by gender (Figure 1), the following data were obtained.


**Figure 1. Distribution of patients by gender**

In both groups we observed, the proportion of women and men was almost the same.

When we analyzed comorbid conditions in patients (Fig. 2), patients with overweight were the majority in both groups, they were 12 patients (66.6%) in the control group, and 15 patients (65.2%) in the main group, arterial hypertension (AH) observed in 3 patients (16.6%) in the control group, in 5 patients (21.7%) in the main group, diabetes mellitus (DM) observed in 2 patients (11.1%) in the control group, in 1 patient (4.3%) in the main group, ischemic heart disease (IHD) in 3 patients in both groups, and reached 16.6 and 13.0%, respectively.

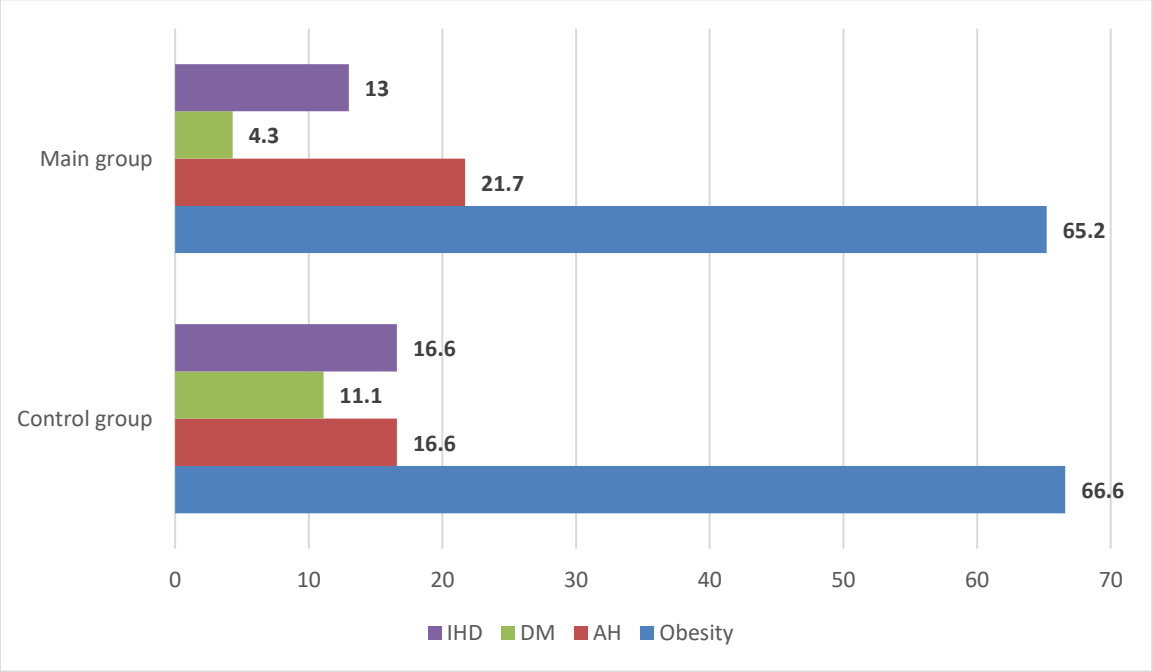



**Figure 2. Disposition of patients by comorbid conditions**



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Thus, patients with high body mass index were the majority of comorbid conditions in both groups. It was found that in the control group, compared to the main group, there were more cases of IHD and diabetes, and in the main group, there were more patients with arterial hypertension compared to the control group.

When we analyzed the time course of clinical indices breakthrough treatment in patients we observed (Table 3), the following data were obtained.

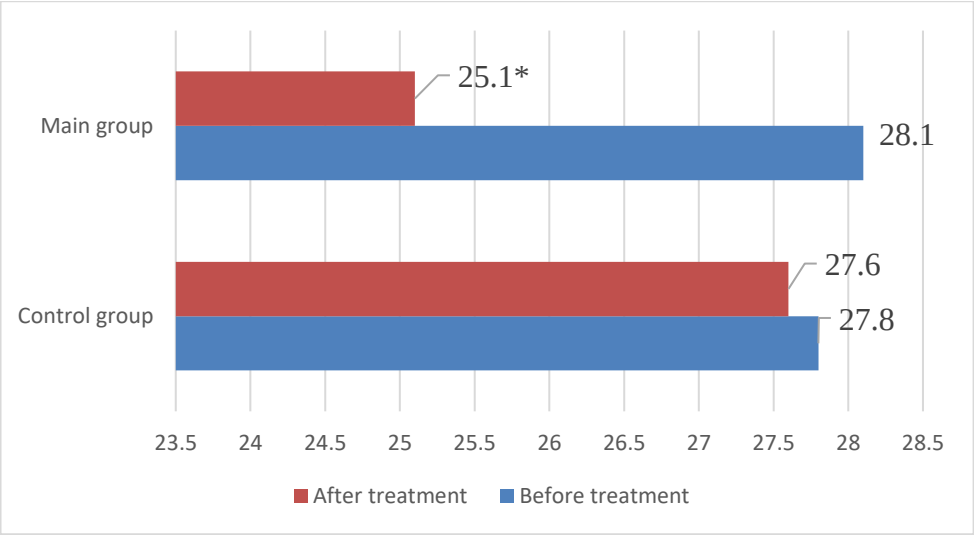
**Table 3 Time course of clinical indices in patients**

| Clinical signs | Control group | | Main group | |
|---|---|---|---|---|
| | Before treatment | After treatment | Before treatment | After treatment |
| VAS scale (score) | 51.2±4.31 | 40.3±3.22* | 61.4±4.28 | 11.7±2.12* |
| Leken index (score) | 6.39±0.21 | 6.6±0.23 | 6.71±0.19 | 4.23±0.14* |
| Pain intensity (score) | 1, 52±0.12 | 1, 39±0.11 | 1.3 3±0.061 | 0.8 4±0.052* |
| Morning stiffness (minutes) | 32 .29 ±5.82 | 29.29±6.71 | 3 1.2 8±6.12 | 17.91±5.21* |

* The difference between before and after treatment is $p<0.05$

According to the data presented in Table 3, when comparing the results before and after the treatment in the main group, the significance level was $p<0.05$ which can be seen in the decrease of pain intensity in the joints according to the visual analog scale (VAS) ( from 61.4±4.28 to 11.7±2 , up to 12 ), improvement of the functional state of the joints according to the Leken index ( from 6.71±0.19 4.23±0.14 ) and pain intensity ( from 1.33±0.061 to 0.84±0.052 ) also morning stiffness ( from 31.28±6.12 to 17.91±5.21 ) have changed positively . In the control group, it was found that only in the VAS scale had a significance level of $p<0.05$.

A high body mass index (BMI) in patients is considered one of the factors that contribute to the development of OA. The results obtained in studying the effect of complex rehabilitation measures on BMI are presented in Figure 3.




* The difference between before and after treatment $p<0.05$

**Figure 3. Patients' body mass index time course**

As a result of the study (Fig. 3), patients' body mass index decreased significantly ($p<0.05$) after the treatment exercises and Nordic walking were recommended to the main group of patients .

Thus, the results obtained in our study show that it is necessary to improve the diagnostic criteria of patients with early OA. Rehabilitation programs used in complex treatment showed a statistically significant improvement of clinical symptoms, body weight index decreased, VAS, Leken's index changed positively in main group patients compared to the control group.

## REFERENCES


1. Abdurazzakova D.S., Nabieva D.A., Usmankhodjaeva A.A., et al. Effectiveness of rehabilitation programs in complex treatment of early osteoarthritis. International Journal of Education, Social Science & Humanities. Finland Academic Research Science Publishers. Volume-11| Issue-12.2023. P.456-462. doi.org/ 10.5281/zenodo.10259012
2. Alliston T, Hernandez CJ, Findlay DM, et al. Bone marrow lesions in osteoarthritis: What lies beneath. J Orthop Res. 2018 Jul;36(7): 1818-25. doi: 10.1002/jor.23844. Epub 2018 May 22.
3. Du Souich P. Absorption, distribution and mechanism of action of SYSADOAS. Pharmacol Ther. 2014 Jun;142(3):362-74. doi: 10.1016/j.pharmthera.2014.01.002. Epub 2014 Jan 21.
4. Favero M, Ramona R, Goldring MB, et al. Early knee osteoarthritis. RMD Open. 2015 Aug 15;1(Suppl 1):e000062. doi: 10.1136/rmdopen-2015-000062. eCollection 2015.
5. Hiligsmann M, Cooper C, Arden N, et al. Health economics in the field of osteoarthritis: an expert's consensus paper from the European Society for Clinical and Economic Aspects of Osteoroporis and Osteoarthritis (ESCEO). Semin Arthritis Rheum. 2013 Dec; 43(3):303-13. doi: 10.1016/j.semarthrit.2013.07.003. Epub 2013 Aug 29.
6. Hunter DJ, Nevitt M, Losina E, Kraus V. Biomarkers for osteoarthritis: current position and steps towards further validation. Best Pract Res Clin Rheumatol. 2014 Feb;28(1):61-71. doi: 10.1016/j.berh.2014.01.007.
7. Jaremko JL, Jeffery D, Buller M, et al. Preliminary validation of the Knee Inflammation MRI Scoring System (KIMRISS) for grading bone marrow lesions in osteoarthritis of the knee: data from the Osteoarthritis Initiative. RMD Open. 2017 Jan 18;3(1):e000355. doi: 10.1136/rmdopen- 2016-000355. eCollection 2017.
8. Luyten FP, Bierma-Zeinstra S, Dell'Accio F,et al. Toward classification criteria for early osteoarthritis of the knee. Semin Arthritis Rheum. 2018 Feb;47(4):457-463. doi: 10.1016/j.semarthrit.2017.08.006. Epub 2017 Aug 9.
9. Luyten FP, Denti M, Filardo G, et al. Definition and classification of early osteoarthritis of the knee. Knee Surg Sports Traumatol Arthrosc. 2012 Mar;20(3):401-6. doi: 10.1007/s00167-011-1743-2. Epub 2011 Nov 8.
10. Lynch JA, Roemer FW, Nevitt MC, et al. Comparison of BLOKS and WORMS scoring systems part I. Cross sectional comparison of methods to assess cartilage morphology, meniscal damage and bone marrow lesions on knee MRI: data from the osteoarthritis initiative. Osteoarthritis Cartilage. 2010 Nov;18(11): 1393-401. doi: 10.1016/j.joca.2010.08.017. Epub 2010 Sep 16.
11. Man GS, Mologhianu G. Osteoarthritis pathogenesis – a complex process that involves the entire joint. J Med Life. 2014 Mar 15;7(1):37-41. Epub 2014 Mar 25.




Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

12. March L, Cross M, Lo C, et al; Osteoarthritis Research Society International. Osteoarthritis: A Serious Disease. Osteoarthritis Research Society International; 2016. P. 1–103.
13. Zhang W, Doherty M, Peat G, et al. EULAR evidence-based recommendations for the diagnosis of knee osteoarthritis. Ann Rheum Dis. 2010 Mar;69(3):483-9. doi: 10.1136/ard.2009.113100. Epub 2009 Sep 17.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5