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**ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE**

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PATHOLOGICAL PARAMETERS OF SYNOVIAL FLUID BEFORE AND AFTER TREATMENT IN PATIENTS WITH GONARTHROSIS

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✓ Resume

Gonarthrosis of the knee joint is a disease that primarily affects hyaline cartilage. Over time, it begins to collapse, ceasing to perform its main function. As a result, destruction occurs in other components of the joint and its deformation occurs. Gonarthrosis of the knee joint is the most common disease of all types of arthroses. Some people think that the cause of the development of gonarthrosis is the deposition of salts in the joints, but orthopedic traumatologists believe that the deposition of salts itself is a secondary process and becomes the cause of pain during the development of gonarthrosis, being localized in the places of attachment of ligaments and tendons. Gonarthrosis of the knee joint affects mainly women after 40 years of age, but this non-infectious degenerative disease also occurs in men. A special risk group includes people who are overweight or work in conditions of frequent hypothermia. Gonarthrosis can also occur in people who engage in active sports, including as a result of injuries and injuries.

Keywords: gonarthrosis, synovial fluid, macrophage, Romanowsky-Giemsa stain, synovial mucin.

ПАТОЛОГИЧЕСКИЕ ПОКАЗАТЕЛИ СИНОВИАЛЬНОЙ ЖИДКОСТИ ДО И ПОСЛЕ ЛЕЧЕНИЯ У ПАЦИЕНТОВ С ГОНАРТРОЗОМ

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✓ Резюме

Гонартроз коленного сустава - заболевание, в результате которого страдает преимущественно гиалиновый хрящ. Со временем он начинает разрушаться, прекращая нести основную свою функцию. В результате происходят разрушения в других компонентах сустава и происходит его деформация. Гонартроз коленного сустава - самое часто встречающееся заболевание из всех видов артроза. Некоторые люди думают, что причиной развития гонартроза является отложение солей в суставах, однако травматологи-ортопеды полагают, что само отложение солей является вторичным процессом и становится причиной возникновения болей при развитии гонартроза, локализуясь в местах крепления связок и сухожилий. Гонартрозом коленного сустава страдают в основном женщины после 40 лет, но данное неинфекционное дегенеративно-дистрофическое заболевание встречается и мужчин. В особую группу риска входят люди, страдающие от избыточного веса или работающие в условиях частых переохлаждений организма. Также гонартроз может возникать и у людей, которые занимаются активными видами спорта, в том числе в результате полученных травм и повреждений.

Ключевые слова: гонартроз, синовиальная жидкость, макрофаг, окраска по Романовскому – Гимза, синовиальный муцин.

GONARTROZLI BEMORLARDA DAVOLANISHDAN OLDIN VA KEYIN SINOVIAL SUYUQLIKNING PATOLOGIK PARAMETRLARI

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✓ Rezyume

Tizza bo'g'mining gonartrozi bu - birinchi navbatda gialin tog'ayni shikastlaydigan kasallik. Vaqt o'tishi bilan u o'zining asosiy funksiyasini bajarishni to'xtatib, qulab tusha boshlaydi. Natijada, bo'g'imning boshqa tarkibiy qismlarida vayronagarchilik yuzaga keladi va uning deformatsiyasi sodir bo'ladi. Tizza qo'shimchasining gonartrozi - barcha turdagi artrozlarning eng keng tarqalgan kasalligi. Ba'zi odamlar gonartroz rivojlanishining sababi bo'g'imlarda tuzlarning cho'kishi deb o'ylashadi, ammo ortoped-travmatologlar tuzlarning cho'kishi ikkilamchi jarayon ekanligiga ishonishadi va gonartroz rivojlanishi paytida og'riqning sababi bo'lib, ular ligamentlar va tendonlarning biriktirilish joylari lokalizatsiya qilinadi. Tiz bo'g'imlarining gonartrozi asosan 40 yoshdan keyin ayollarga ta'sir qiladi, ammo bu yuqumli bo'lmagan degenerativ-distrofik kasallik erkaklarda ham uchraydi. Maxsus xavf guruhiga ortiqcha vaznli yoki tez-tez gipotermiya sharoitida ishlaydigan odamlar kiradi. Gonartroz faol sport bilan shug'ullanadigan odamlarda, shu jumladan jarohatlar va shikastlanishlar natijasida ham paydo bo'lishi mumkin.

Kalit so'zlar: gonartroz, synovial suyuqlik, makrofag, Romanovskiy-Gimza usulida bo'yash, synovial mutsin.

Relevance

Osteoarthritis is a polyetiological degenerative-dystrophic disease characterized by damage to the metaphyseal and subchondral parts of the articular bone, the articular cartilage, and damage to the joint's synovial shell, cartilage, capsule, and muscles. This, in turn, is manifested by the formation of bony tumors and the limitation of movement in the joint, as well as the appearance of pain [5,7].

According to epidemiological studies, 8% to 20% of the elderly population suffer from this disease, the most common localization of pathology is degenerative-dystrophic joint damage, characterized by temporary loss of working capacity. Osteoarthritis is increasing day by day in older age groups [1,11]. Osteoarthritis can be considered the most common pathological process among diseases. The causes of osteoarthritis have not been fully studied to date. Therefore, this problem remains one of the unsolved problems of traumatology and orthopedics [4].

In arthrosis of the knee joint, joint traumatization and physical stress have a special place. People who are overweight put a lot of stress on the joints, and as a result, this stress promotes the development of arthrosis in the joints. Not only the articular cartilage, but also other elements of the joint, subchondral bone, ligaments, capsule, synovial shell and periarticular muscles are involved in the pathological process [2]. Osteoarthritis is one of the main causes of disability in older people. Gonarthrosis is a disease of the musculoskeletal system along with osteoporosis [9]. Arterial hypertension (more than 60% of patients), ischemic heart disease, heart failure, obesity, diabetes, lung diseases (chronic obstructive lung diseases) and gastrointestinal tract diseases are among the pathologies that occur together with knee arthrosis [3,6].

According to different authors, the prevalence of OA in the population is 3% to 10%. [8]. According to the results of the epidemiological investigation of scientists in the CIS countries, the prevalence of OA is 6.43%. At the same time, the disease increases with age: among them, 27.1% are over 50 years old, and 97% are over 60 years old. In general, the number of patients with OA is 10-12% of the population, so about one-third of them have a degree of disability [10,12].

Osteoarthritis (osteoarthritis disease) is characterized by pain in the joints, their sensitivity to palpation, limited mobility and crepitation, occasional separations and various degrees of inflammation, and is not accompanied by systemic effects. The notion that osteoarthritis is a degenerative disease has

become a thing of the past. Currently, the theory of inflammation was developed after the discovery of the main role of anti-inflammatory cytokines IL-10 and TNF- α in the pathogenesis of osteoarthritis. [13].

Research objective: To study and compare pathological parameters of synovial fluid before and after treatment in patients with gonarthrosis.

Material and methods

The methods of study of this scientific work were carried out in 2019-2022 at the traumatology and orthopedics practical department of the Bukhara regional multidisciplinary medical center in 114 patients treated with the diagnosis of osteoarthritis of the knee joint of various degrees. The duration of the course of the disease was from 6 months to 15 years from the anamnesis of the patients. All patients received conservative treatment. Written informed consent was obtained from all patients before the study.

114 patients between the ages of 25 and 75, who were involved in the scientific research, were divided into 2 groups: the main n=70 and the control group n=44. 30 patients (26.4%) were women, 84 patients (73.6%) were men, of which the main group included women n=16 (53.3%), men n=60 (71.4%), in the control group there were women n=14 (46.6%), men n=24 (28.6%).

To determine the biochemical composition of synovial fluid, the following parameters were determined: volume, color, viscosity, clarity, etc. Normally, the volume of synovial fluid is not large, but in some inflammatory diseases of the joints, its volume increases. This inflammatory fluid is performed by puncturing the joint (arthrocentesis). When performing these manipulations, it is not advisable to use a solution of novocaine, because this tool can cause cell erosion. The most important thing to perform arthrocentesis is its cleanliness. For this, synovial fluid is taken from the suprapatellar space of the knee joint. The process of obtaining synovial fluid is carried out in the following stages:

- 1) Clean the skin, treat with iodine and alcohol, wrap with a clean towel;
- 2) Anesthetizing the skin and soft tissues with 10-15 ml of 0.5% novocaine solution;
- 3) With a 10.0 syringe, a needle is inserted, taking into account the 1.0 cm upper and 1.5 cm outer corner of the kneecap (a feeling of entering the cavity) and the synovial fluid is evacuated.

After obtaining synovial fluid, a thorough examination of this fluid was carried out at the microscopic level and staining was performed according to Romanovsky - Giemsa.

Results and discussions

Pathological indicators of synovial fluid in osteoarthritis of the knee joint.

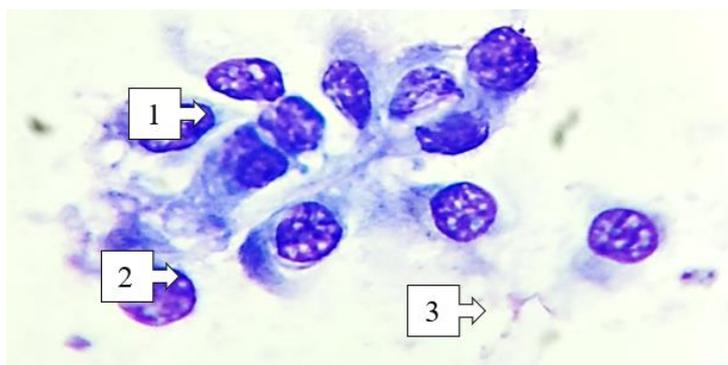


Figure 1. Synovial fluid. Stained by the Romanovsky-Giemza method. 10 ok x10 ob.

1. Macrophage-like synovial cell or type A synoviocytes - group. In active state. (Inflammatory change)

2. The cytoplasm is wide, with many vacuoles.

3. The nucleus is enlarged, the chromatin strands are coarsened, nucleoli are visible.

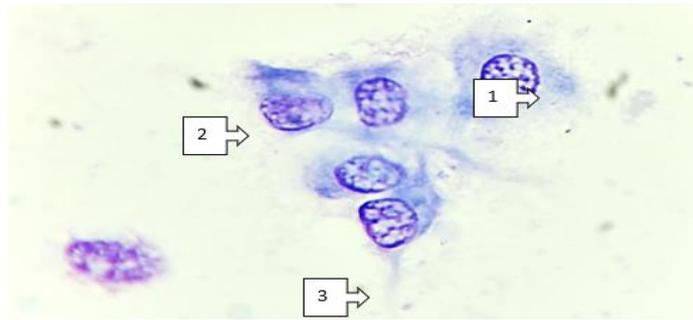


Figure 2. Synovial fluid. Stained by the Romanovsky-Giemza method. 10 ok x10 ob.

1. Macrophage-like synovial cell or type A synoviocytes - group. In active state. (Inflammatory change)
2. The cytoplasm is wide, with many vacuoles.
3. The nucleus is enlarged, the chromatin strands are coarsened, nucleoli are visible.

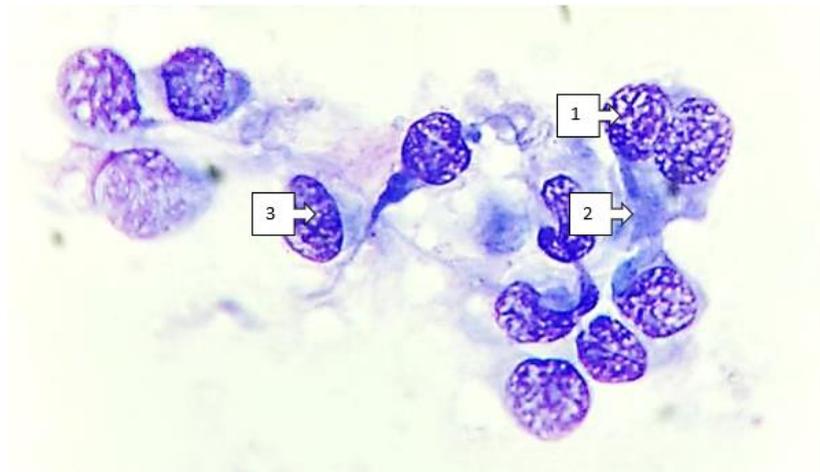


Figure 3. Synovial fluid. Stained by the Romanovsky-Giemza method. 10 ok x10 ob.

1. Macrophage-like synovial cell or type A synoviocytes - group. In active state. (Inflammatory change)
2. The cytoplasm is wide, with many vacuoles.
3. The nucleus is enlarged, the chromatin strands are coarsened, nucleoli are visible.

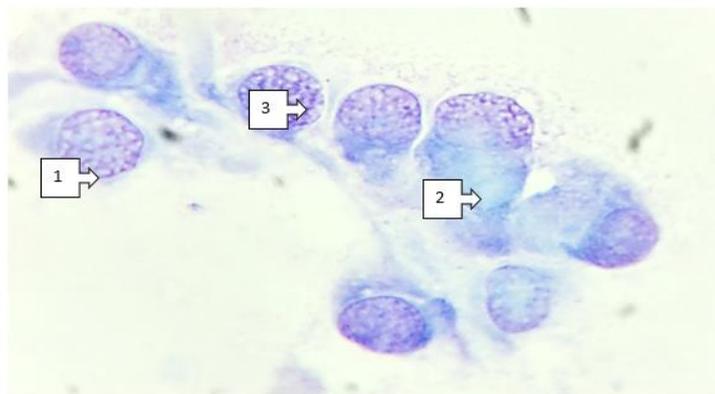


Figure 4. Synovial fluid. Stained by the Romanovsky-Giemza method. 10 ok x10 ob.

1. Macrophage-like synovial cell or type A synoviocytes - group. In active state. (Inflammatory change)
2. The cytoplasm is wide, with many vacuoles.

3. The nucleus is enlarged, the chromatin strands are coarsened, nucleoli are visible.

Changes occur in the inner synovial membrane with blood vessels fullness, swelling and vascular phenomenon. The following cells are actively involved in this process. 1. Macrophage-like synovial cell or type A synoviocyte is observed to become active, cell proliferation, increase in number, expansion of cytoplasm, increased number of multi-vacuole-lysosomal enzymes, enlarged nucleus, roughening of chromatin strands, appearance of nucleoli are observed. In this case, it can be understood that the cells are actively performing the task of phagocytosis and reduction of excess synovial fluid. 2. A non-phagocytizing synoviocyte or type V fibroblastic synovial cell. During the activity of these cells, the synthesis of hyaluronic acid increases, that is, the water transport from the capillaries to the synovial fluid increases, and the supply of nutrients and oxygen to the joints increases. The color of the synovial fluid is turbid, sticky, and contains a large number of neutrophils, lymphocytes, monocytes, and macrophages.

Post-treatment pathological indicators of synovial fluid in osteoarthritis of the knee joint

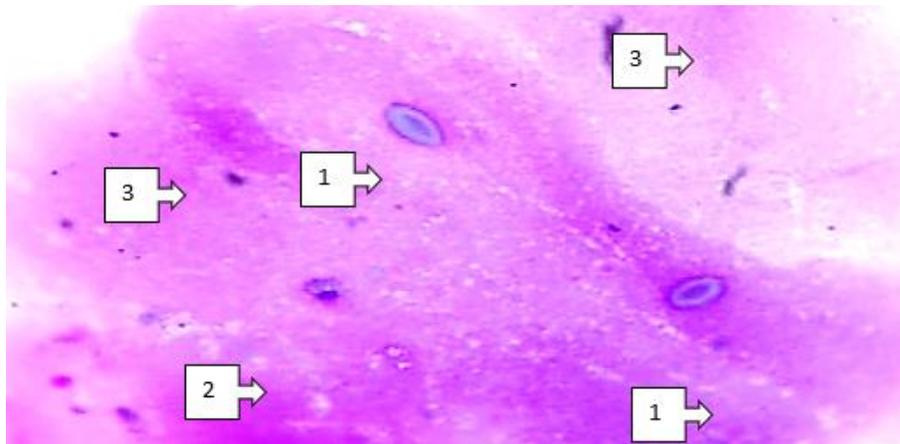


Figure 5. Synovial fluid. Stained by the Romanovsky-Giemza method. 10 ok x10 ob.

1. Non-phagocytized synoviocyte or Vtype fibroblastic synovial cell.
2. A poorly differentiated cell.
3. Synovial mucin (homogeneous-vacuolar)-gel.

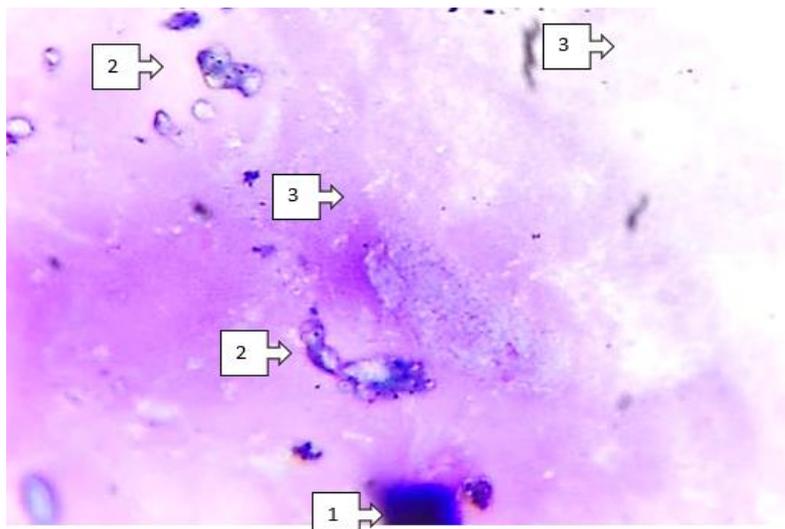


Figure 6. Synovial fluid. Stained by the Romanovsky-Giemza method. 10 ok x10 ob.

1. Non-phagocytized synoviocyte or Vtype fibroblastic synovial cell.
2. A poorly differentiated cell.
3. Synovial mucin (homogeneous-vacuolar)-gel.

Macrophage-like synovial cells or type A synoviocytes were observed to lyse pathologically active substances in the center, eliminate phagocytosis and excess synovial fluid, and become inactive. In this case, it was found that the cytoplasm of this cell became smaller, the nucleus became smaller, and the chromatin threads and nuclei became invisible.

Non-phagocytizing synoviocyte or type V fibroblastic synovial cells were observed to enter a stationary state. In this process, it was found that due to the normalization of the synthesis of hyaluronic acid, the transport of water from the capillaries to the synovial fluid was normalized, and the supply of nutrients and oxygen to the joints was improved. It was found that the color of the synovial fluid is pale yellow, viscous, and contains a large number of neutrophils, lymphocytes, monocytes, and macrophages.

Conclusions

1. *Before treatment.* Various pathological processes in the joints (inflammation, dystrophy, necrosis, etc.) are caused by the influence of synovial membranes and create the basis for processes such as the formation of biologically active substances (inflammatory mediators), increased vascular permeability, and chemotaxis. Changes occur in the inner synovial membrane with blood vessels fullness, swelling and vascular phenomenon.

2. *After treatment.* After treating various pathological processes in the joints, i.e., inflammation, dystrophy, necrosis, etc., with traditional medicine and autothrombotic mass, the following morphological processes were revealed: blood circulation in blood vessels (arterial and venous) in the inner synovial membrane improved, swelling disappeared. Vascular permeability has normalized.

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