



## FEATURES OF THE SYNDROMES OF OSTEOPOROSIS AND SARCOPENIA IN RHEUMATOID ARTHRITIS WITH MUSCLE WEAKNESS

Akhmedov Ibrat<sup>1</sup>,  
Islamova Kamola<sup>2</sup>,  
Abdushukurova Komila<sup>3</sup>,  
Toshnazarova Nodira<sup>4</sup>

1 Assistant, PhD Department of Internal Medicine No. 1, Samarkad State Medical Institute, Samarkand, Uzbekistan. Mail: ibrat.jamshed.axmedov@mail.ru

2 Assistant, PhD Department of Internal Medicine No. 1, Samarkad State Medical Institute, Samarkand, Uzbekistan.

3 Senior Lecturer, Department of Internal Medicine No. 1, Samarkad State Medical Institute, Samarkand, Uzbekistan.

4 Assistant, Department of Internal Medicine No. 1, Samarkad State Medical Institute, Samarkand, Uzbekistan.

### ABSTRACT

**Objective.** The aim of the study was to evaluate the syndromes of sarcopenia (SP) and osteoporosis (OP) in RA patients with muscle weakness.

**Material and methods.** In our study, 117 patients with RA were examined. All patients were hospitalized in the rheumatology department of the 1st clinic of the Samara State Medical Institute. The diagnosis was made based on the classification criteria, EULAR and ACR. In the study, 102 patients (87.2%) were women and 15 (12.8%) were men. The age of the surveyed was from 19 to 67 years old, the average age was  $42.4 \pm 11.5$  years. In the examined patients, the duration of the disease ranged from 1 to 30 years, with an average duration of  $9.3 \pm 6.2$  years.

**Results and Discussion.** Our study found that 84 (71.7%) patients had sarcopenia indicating muscle weakness based on the SARC-F review in rheumatoid arthritis. According to the results of our study, sarcopenia was detected in 64 (54.7%) patients with AP and 95 (81.1%) patients with SP, which amounted to 44.7% and increased with the age and duration of the patient's disease. No correlation was found between SP and disease activity level (DAS28, ESR, CRB). When OP and SP were combined, the patient's quality of life index showed low results when using the HAQ questionnaire.

**Conclusion.** Based on our research, SP is a common component of RA and increases the risk of falls and fractures. In making the SP and OP diagnosis, the SARC-F questionnaire showed that the EWGSOP2 criteria, the "chair walking" test, and hand dynamometry could be used. Among these methods, manual hand dynamometer showed higher reliability than other methods.

**Keywords:** rheumatoid arthritis, sarcopenia, SARC-F, osteoporosis.



## Introduction

Rheumatoid arthritis is important in the global health system. At the initiative of the World Health Organization, the first decade of the XXI century has been declared the Decade of Arthritis. Despite the prevalence, pathogenesis, clinic, new diagnostic possibilities of treatment and new effective methods of treatment in the next decade, RA disease remains one of the current problems in the focus of rheumatologists around the world.

According to statistics from recent years, more than 20 million people worldwide suffer from RA disease. Every year, the number of patients with RA increases by 3-4 percent.

In addition, patients with RA often need to see a doctor, undergo many laboratory and diagnostic tests, the cost of regular medications, and the need for frequent inpatient treatment. In an average of 10 years after the onset of the disease, cases in the joints in 1/3 of patients require surgical intervention.

On the other hand, RA disease is considered to be a set of several problems of social significance not only to the patients themselves but also to their family members. Firstly, patients spend more money on diagnosis and treatment due to economic losses, and secondly, the quality of life in patients worsens as a result of the constant exacerbation of the disease, decreased sensitivity of the body to painkillers, joint deformities and impaired joint function.

The long-term chronic exacerbation of RA, the deepening of medical and social problems in patients, the need of patients for social and medical care by the state remain the main medical problems in any country, including Uzbekistan. At the same time, it is affecting the family economy as well as the state economy of the patients.

In the first two decades of our century, world medicine has made significant progress by conducting a series of experiments on the etiology, pathogenesis, clinic, new highly effective methods of treatment and measures to prevent the development of disability in joint diseases, including RA. The development of highly effective basic anti-inflammatory drugs or genetically engineered biological drugs has expanded the possibilities of pathogenetic treatment of the disease, but the high cost of these biological drugs creates economic problems in patients.

Based on the analysis of data collected to date, the etiology of RA disease has not been fully studied, the disease is considered an autoimmune disease with chronic erosive inflammation in the joints caused by complex development of many genetic, immune, endocrine factors and inflammatory cytokines.

However, many factors related to the mechanisms of development of RA disease remain unexplored or controversial until the end. This requires further study of RA disease.

The early correct diagnosis and treatment of muscle damage in RA disease increases the period of disease remission and prevents early disability.

In order to achieve this goal, the American College of Rheumatology and the European League for the Rheumatism (ACR / EULAR) conducted a thorough examination of patients admitted to the hospital with a diagnosis of rheumatoid arthritis according to the classification criteria, specifying the multifactorial factors as well as the effectiveness of therapies performed taking into account the importance of immune inflammation.



There are also cases of RA that raise doubts, which can be considered a complication or concomitant disease. These include problems such as sarcopenia (SP) and osteoporosis (OP) as a disease of the joints, RA syndrome or complications that developed independently in RA. [2.5]

For many years he studied OP camping in many different studies in RA. It is known that chronic inflammation in RA and prolonged intake of glucocorticoids (GC) lead to a decrease in bone mineral density. However, the role of RA in increasing the risk of developing independent osteoporotic fractures has also been proven. Despite many years of research, the incidence of AP in patients with RA in different studies varies greatly - from 11 to 59% [2,3], which may depend on the age, gender and research method of the studied groups. [5.6]

Sarcopenia (SP) is a relatively "new" concept that was introduced into clinical practice in the last years of the last century. The frequency of SP in patients with RA ranges from 13.9 to 39.8 % according to different authors. Until 2018, the European Working Group on Sarcopenia in the Elderly used the EWGSOP (European Working Group on Sarcopenia in the Elderly) to determine the AP according to the recommended criteria. In 2019, these criteria were revised (EWGSOP2) and are currently used in clinical practice. Decreased muscle strength may indicate the presence of SP in patients. A reliable diagnosis of SP can be made only if the decrease in muscle mass is confirmed using instrumental studies. It is also possible to perform OP diagnostics simultaneously with the criteria in the second updated case. [1,2,5]

The aim of our study was an assessment of sarcopenia (SP) and osteoporosis (OP) in patients with RA.

### Material and Methods

To achieve the purpose, and our study was examined 117 patients with RA. All patients were hospitalized in the rheumatology department of the 1st Clinic of SamSMI. The diagnosis has been put based on criteria s classification and EULAR and the ACR. In the course of the study, 102 patients (87.2%) were females and 15 (12.8%) were men. The age of the examined patients ranged from 19 to 67 years, the average age -  $42.4 \pm 11.5$  years. In the examined patients, the duration of the disease ranged from 1 year to 30 years, with an average duration of  $9.3 \pm 6.2$  years.

**Table 1. Demographic characteristics**

Variables	Values (Mean $\pm$ SD)
Age (years)	42.4 $\pm$ 11.5
Duration of RA (years)	9.3 $\pm$ 6.2
Body mass index (BMI)	24,2 $\pm$ 4 , 8
HAQ,	1.48 $\pm$ 0.69
DAS28	4.8 $\pm$ 1.3
ESR, (mm/s)	17 [13; 26]
CRP (mg / l)	12.1 [3.0; 17.1]
GCC> 3 months , n (%)	40 (49.4)
"Genetically engineered drugs"., n (%)	1 (14.8)



Patients with diseases of the heart, kidneys, liver and circulatory system were not included in the study. During the general clinical examination, the complaints of the patients were assessed, as well as the history of life and illness, the general condition of the patients, joint oedema, pain, local hyperemia, the state of soft tissues and the duration of morning stiffness of the joints. From the first days of hospitalization, all patients underwent clinical, laboratory, instrumental, immunological, and muscle-functional examinations following the standard. Also, all patients completed the SARC-F questionnaire independently. The result of the SARC-F questionnaire was scored on a scale from 0 to 10, with 4 or higher being recognized as symptoms of SP. Muscle strength was assessed using a mechanical hand-held dynamometer. In dynamometer, hand low indicator 16 kg and standing without support on the chair e in muscle weakness evaluated as less than 5 times for 15 seconds. Functional disturbances evaluated Referring to HAQ (Health Assessment Questionnaire) index, and the activity of RA was determined according to DAS28.

### Results

In the study, 80 patients (72.6%) were under 50 years of age. Disease activity was high in 40 (34.1%) patients, the average level had 70 (59.8%) patients. RA activity according to the DAS28 index corresponded to the period of remission only in 5 patients (4.2%). Taking GCS for more than 6 months was observed in 108 patients (49.4%). It was found that 1 (0.8%) patient received genetically engineered biological preparations (GIBP). According to the study SARC-F, in 84 (71.7%) patients has revealed sarcopenia. According to the results of comparative analysis of the patient 64 and diagnosed with sarcopenia (54.7%) and 53 (45.3%) without sarcopenia. The incidence of RA was higher in patients with SP than in patients without SP, and the body mass index (BMI) was significantly lower, and muscle strength was found to be low in line with these indicators. There was no association between the usage of corticosteroids and age as well as sex of patients.

**Table 2. Comparative characteristics of the patients in a joint venture and the joint venture without**

Indicator	(+)SP (n=64)	(-)SP (n= 53)	P-value
Age, years, M ± SD	42.5 ± 6.9	59.1 ± 8.4	> 0.05
Age < 5 0 years, n, (%)	42 ( 65.6 )	32 (53)	> 0.05
Duration of RA, years, Me	9.1 [ 1 ; 3 0 ]	6 [1; 15 ]	> 0.05
BMI, kg / m 2, Me	24.5 [22.4; 25.8]	27.7 [25.5; 32.4]	> 0.05
Falls over 1 year, n (%)	11 ( 17.1 )	4 ( 7.5 )	> 0.05
Repeated falls, n (%)	4 ( 6 )	1 ( 1 , 8 )	> 0.05
HA intake, n (%)	62 ( 96.8 )	48 ( 90.5 )	> 0.05
HAQ, M ± CO	1.50 ± 0.82	1.47 ± 0.67	> 0.05
DAS28, M ± CO	4.6 ± 1.6	4.8 ± 1.1	> 0.05
ESR, mm / h, Me	16 [ 15 ; 65 ]	18 [13; 31]	> 0.05

In an analysis of the results obtained using the SARC-F questionnaire, the degree of sarcopenia, which represents a decrease in muscle mass and muscle strength in patients, found that when 95 (81.1%) patients were assessed for muscle strength, a manual compression force



of less than 16 kg was dominant. This method showed a high sensitivity (92%) to the SARC-F study. Data on sarcopenia in patients with RA showed a significant decrease in muscle mass and strength. Of the total patients, 19 (16.2%) developed very severe symptoms of sarcopenia. Patients with pain caused by movement of the joints during the “walk in a chair” test had a lower result than a manual dynamometer because the patients had difficulties. Detection of OP was observed in almost all patients. Based on the results of the analysis of more than 1 fall and bone fracture in 1 year, based on the SARC-F survey of patients in the study groups, we observed the incidence of bone fractures in only 1 patient.

### Discussion

According to a study by Cruz-Jentoft AJ, Bahat G, Bauer JM, Boirie Y, Bruyère O, Cederholm T, and co-authors (2019), conducting a sarcopenia survey by health care providers can help identify early sarcopenia or properly organize patient treatment measures when sarcopenia occurs.

In the study of R. Krzimitska-Siemasco and co-authors, the sensitivity of the SARC-F study in the diagnosis of a joint venture ranged from 35% to 95%. Y.A. In a study of Safonov and co-authors in patients with various injuries of the musculoskeletal system, the sensitivity and specificity of the SARC-F survey were 41.7% and 68.5%, respectively [1,12].

Screening for decreased muscle strength and volume in women with RA revealed that 42% of patients developed sarcopenia through the EWGSOP2 survey.

This has been described in previous studies in patients of different ages, and in some studies using different tools to determine different SP criteria or muscle mass by gender.

In our study, sarcopenia accounted for 44.7% based on the results of observational analysis in RA patients. muscle mass and strength were significantly reduced, with a very strong  $8 \leq$  development of sarcopenia symptoms in 19 (16.2%) indicating a decrease in muscle mass, and a decrease in muscle mass was observed to directly lead to a decrease in muscle strength and function. We used updated Sarcopenia criteria and our data were consistent with the results of other studies

Some studies have shown that the joint venture is correlated was found with age and duration of disease in patients with RA, whereas in our study that the joint venture increasing with age and duration of disease. We also observed patients with SP, which coincides with the data of several authors [10].

However, in our study, as in other studies, no correlation was found between SP and disease activity levels (DAS28, ECG, CRP). The number of patients in both groups was the same, they were receiving KS, so we did not observe significant differences in the dose of HA intake in patients with SP [8,9].

In determining the quality of life of patients on the HAQ functional index, in our study, OP was observed in almost all patients and in patients combined with SP, a decrease in muscle strength and function was observed in limiting patients 'self-care ability in RA, thereby reducing patients' quality of life. the quality of life indicator in the patient showed very low HAQ results.





### Conclusion

Thus, SP and OP are the most common conditions in RA. In these patients, decreased muscle mass increases the risk of falls and bone fractures due to decreased muscle strength. When diagnosing SP and OP in the early stages of the disease in patients with RA in the primary health care system, the SARC-F questionnaire according to the EWGSOP2 criteria and the test "walking in a chair" and methods of arm dynamometry will be available. With these techniques in hand, dynamometry showed reliability in comparison with two other methods of assessing the level of the joint venture and muscle strength.

### References:

1. Akramovna, I. K., & Zaynobiddin o'g'li, F. J. (2023). RISK FACTORS OF EARLY DEVELOPED OSTEOARTHRITIS. BEST SCIENTIFIC RESEARCH-2023, 2(1), 28-35.
2. Alisherovna, K. M. CYSTATIN C IS AN EARLY MARKER OF DECREASED KIDNEY FUNCTION.
3. Alisherovna, K. M., & Tatlibayevich, Y. S. (2021, April). Renal hemodynamics and glomerular filtration in patients with hypertension disease at the age of 40-60 years. In Euro-Asia Conferences (Vol. 3, No. 1, pp. 146-149).
4. Alisherovna, K. M., Rustamovich, T. D., Baxtiyorovich, U. J., & Sobirovna, S. M. (2022). Diabetes Mellitus and Hyperglycemia in Patients with Rheumatoid Arthritis. Texas Journal of Medical Science, 13, 99-103.
5. Alisherovna, K. M., Toshtemirovna, E. M. M., Totlibayevich, Y. S., & Xudoyberdiyevich, G. X. (2022). EFFECTIVENESS OF STATINS IN THE PREVENTION OF ISCHEMIC HEART DISEASE. Web of Scientist: International Scientific Research Journal, 3(10), 406-413.
6. Djamshedovna, K. D., Alisherovna, K. M., Xudoyberdiyevich, G. X., & Rustamovich, T. D. (2023). EFFECTIVENESS OF ANTIHYPERTENSIVE THERAPY IN PREGNANT WOMEN. Spectrum Journal of Innovation, Reforms and Development, 12, 137-144.
7. Islamova, K. A. (2022, November). SEMIZLIK BOR BEMORLARDA OSTEOARTROZ KASALLIGINING KLINIK XUSUSIYATLARI. In INTERNATIONAL CONFERENCES (Vol. 1, No. 10, pp. 299-301).
8. Islamova, K. A., Olimdjanova, F. J. Q., Ziyadullaev, S. K., & Kamalov, Z. S. (2022). RISK FACTORS FOR EARLY DEVELOPMENT OF OSTEOARTHRITIS.
9. Khabibovna, Y. S., & Abdukodirovna, A. S. (2021). Changes In The Diastolic Function Of The Right Ventricle In Arterial Hypertension. Web of Scientist: International Scientific Research Journal, 2(11), 161-169.
10. Khabibovna, Y. S., & Buriboevich, N. M. (2021). Change Of Structural And Functional Heart Indicators In Patients With Diabetes Mellitus With Diastolic Heart Failure. Web of Scientist: International Scientific Research Journal, 2(11), 144-150.
11. Khusainova, M. A. (2023). CYSTATIN C IS AN EARLY MARKER OF DECREASED KIDNEY FUNCTION. Oriental renaissance: Innovative, educational, natural and social sciences, 3(1), 485-490.



12. Khusainova, M. A., Eshmamatova, F. B., Ismoilova, K. T., & Mamadiyorova, M. M. (2023). METABOLIC SYNDROME IN RHEUMATOID ARTHRITIS AS A CRITERION OF CARDIOVASCULAR RISK. *Oriental renaissance: Innovative, educational, natural and social sciences*, 3(1), 331-339.
13. Khusainova, M. A., Vakhidov, J. J., Khayitov, S. M., & Mamadiyorova, M. M. (2023). Cardiac arrhythmias in patients with rheumatoid arthritis. *Science and Education*, 4(2), 130-137.
14. Nizamitdinovich, X. S., & Toshtemirovna, E. M. (2021). Pathogenetic relationship of metabolic disorders in patients with arterial hypertension and diabetes type 2. *Web of Scientist: International Scientific Research Journal*, 2(11), 156-160.
15. Nurmamadovna, I. N., & Abdurasulovna, A. K. (2020). Features Antihypertensive Therapy Obesity. *The American Journal of Medical Sciences and Pharmaceutical Research*, 2(11), 28-31.
16. Rustamovich, T. D., Alisherovna, K. M., Djamshedovna, K. D., & Nizamitdinovich, K. S. (2023). Features of the Psychoemotional Status of Patients with Rheumatoid Arthritis. *Miasto Przyszłości*, 32, 23-30.
17. Rustamovich, T. D., Alisherovna, K. M., Nizamitdinovich, K. S., & Djamshedovna, K. D. (2022). Gastrointestinal Conditions in Rheumatoid Arthritis Patients. *Texas Journal of Medical Science*, 15, 68-72.
18. Toshtemirovna, E. M. M., Alisherovna, K. M., Erkinovna, K. Z., & Xudoyberdiyevich, G. X. (2022). DIAGNOSIS OF CIRRHOTIC CARDIOMYOPATHY. *Spectrum Journal of Innovation, Reforms and Development*, 10, 141-147.
19. Totlibayevich, Y. S., Alisherovna, K. M., Xudoyberdiyevich, G. X., & Toshtemirovna, E. M. M. (2022). Risk Factors for Kidney Damage in Rheumatoid Arthritis. *Texas Journal of Medical Science*, 13, 79-84.
20. Uzokov, J. B., Khusainova, M. A., Eshmamatova, F. B., & Mamadiyorova, M. M. (2023). Correction of violations rheology of blood in ischemic heart disease. *Science and Education*, 4(2), 153-159.
21. Xudoyberdiyevich, G. X., Alisherovna, K. M., Davranovna, M. K., & Toshtemirovna, E. M. M. (2022). FEATURES OF HEART DAMAGE IN PATIENTS WITH VIRAL CIRRHOSIS OF THE LIVER. *Spectrum Journal of Innovation, Reforms and Development*, 10, 127-134.
22. Xudoyberdiyevich, G. X., Alisherovna, K. M., Rustamovich, T. D., & Djamshedovna, K. D. (2023). QUALITY OF LIFE IN PATIENTS WITH GOUT. *Spectrum Journal of Innovation, Reforms and Development*, 12, 156-164.
23. Xudoyberdiyevich, G. X., Alisherovna, K. M., Toshtemirovna, E. M., & Jamshedovna, K. D. (2022). Features of portal blood circulation and echographic structure of the liver in patients with chronic heart failure. *Web of Scientist: International Scientific Research Journal*, 3(5), 576-581.
24. Xudoyberdiyevich, G. X., Alisherovna, K. M., Toshtemirovna, E. M. M., & Totlibayevich, Y. S. (2022). Characteristics Of Neuropeptides-Cytokines in Patients with Cardiovascular

- Pathology Occurring Against the Background of Anxiety and Depressive Disorders. The Peerian Journal, 11, 51-57.
25. Yarmatov, S. T., & Xusainova, M. A. (2021). BRONXIAL ASTMA MAVJUD BO'LGAN BEMORLARDA GASTROEZOFAGIAL REFLYUKS KASALLIGI DIAGNOSTIKASI VA OLIB BORISH ALGORITMI. Scientific progress, 2(2), 208-213.
  26. Yarmatov, S. T., & Xusainova, M. A. (2021). Yurak Ishemik Kasalligi Mavjud Bo'lgan Bemorlarda. Scientific progress, 2(3), 785-791.
  27. Yarmukhamedova, S., Nazarov, F., Mahmudova, X., Vafoeva, N., Bekmuradova, M., Gaffarov, X., ... & Xusainova, M. (2020). Features of diastolic dysfunction of the right ventricle in patients with hypertonic disease. Journal of Advanced Medical and Dental Sciences Research, 8(9), 74-77.
  28. Yarmukhamedova, S., Nazarov, F., Mahmudova, X., Vafoeva, N., Bekmuradova, M., Gafarov, X., ... & Xusainova, M. (2020). Study of indicators of intracardial hemodynamics and structural state of the myocardium in monotherapy of patients with arterial hypertension with moxonidin. Journal of Advanced Medical and Dental Sciences Research, 8(9), 78-81.
  29. Ахмедов, И. А. (2016). Влияние физиотерапевтических процедур у пациентов с язвенной болезнью двенадцатиперстной кишки. Экспериментальная и клиническая гастроэнтерология, (2 (126)), 96.
  30. Ахмедов, И. А., & Ташинова, Л. Х. (2020). REVMATOID ARTRIT KASALLIGIDA BO 'G 'IM VA BRONXOPULMONAL O 'ZGARISHLARNI ERTA ANIQLASHDA MAGNIT REZONANS VA KOMPYUTER TOMOGRAFIYANING IMKONIYATLARI. Журнал кардиореспираторных исследований, 1(3).
  31. Вафоева, Н. А. (2020). Особенности клинической картины хронического пиелонефрита у женщины. Вестник науки и образования, (18-2 (96)), 92-94.
  32. Ибадова, О. А., & Аралов, Н. Р. (2020). Диагностические трудности и различия в терминологии идиопатической фиброзирующей болезни легких (литературный обзор). Достижения науки и образования, (2 (56)), 63-67.
  33. Ибадова, О. А., & Шодикулова, Г. З. (2022). ОЦЕНКА ПРОГНОСТИЧЕСКОЙ ЗНАЧИМОСТИ ИНТЕНСИВНОСТИ И ЧАСТОТЫ КАШЛЯ У ПАЦИЕНТОВ С ИНТЕРСТИЦИАЛЬНЫМ ПОРАЖЕНИЕМ ЛЕГКИХ. Журнал кардиореспираторных исследований, 3(2).
  34. Ибадова, О. А., Аралов, Н. Р., & Курбанова, З. П. (2020). Роль сурфактантного белка D (SP-D) в иммунном ответе при неспецифической интерстициальной пневмонии. Достижения науки и образования, (4 (58)), 45-49.
  35. Ибадова, О. А., Шодикулова, Г. З., & Нажмиддинов, А. Ш. ТРУДНОСТИ ДИФФЕРЕНЦИАЛЬНОЙ ДИАГНОСТИКИ НЕСПЕЦИФИЧЕСКОЙ ИНТЕРСТИЦИАЛЬНОЙ ПНЕВМОНИИ.
  36. Исламова, К. А., & Тоиров, Э. С. (2019). Значение факторов риска на качество жизни больных остеоартрозом. In Актуальные вопросы современной медицинской науки и здравоохранения: сборник статей IV Международной научно-практической конференции молодых учёных и студентов, IV Всероссийского форума



- медицинских и фармацевтических вузов «За качественное образование», (Екатеринбург, 10-12 апреля 2019): в 3-х т.-Екатеринбург: УГМУ, CD-ROM.. Федеральное государственное бюджетное образовательное учреждение высшего образования «Уральский государственный медицинский университет» Министерства здравоохранения Российской Федерации.
37. Ишанкулова, Н. Н., & Ахмедов, И. А. (2016). Клиническая картина язвенной болезни двенадцатиперстной кишки. Экспериментальная и клиническая гастроэнтерология, (2 (126)), 96.
  38. Тоиров, Э., Ахмедов, И., & Султонов, И. (2020). Дисбаланс нервной и эндокринной системы при ревматоидном артрите. Журнал кардиореспираторных исследований, 1(2), 73-76.
  39. Хусаинова, М. А. (2022). OZONETHERAPY IN RESTORATIVE TREATMENT PATIENTS WITH CORONARY HEART DISEASE. Журнал кардиореспираторных исследований, 3(4).
  40. Ярмухаммедова, С., Гаффоров, Х., & Ярматов, С. (2020). Jigar Sirrozida Yurakning Sistolik Va Diastolik Disfunksiyasining Ahamiyati. Журнал кардиореспираторных исследований, 1(2), 85-87.