ISBN: 978-93-86584-21-7

COMORBID PASTCHE OF GOUT AND CARDIOVASCULAR DAMAGE

Tairov Doston Rustamovich
Yarmukhamedova TCodat Habibovna
Nazarov Feruz Yusufovich

Published by
Novateur Publication
466, Sadashiv Peth, M.S.India-411030

www.novateurpublication.org

SAMARKAND STATE MEDICAL UNIVERSITY

COMORBID PASTCHE OF GOUT AND CARDIOVASCULAR DAMAGE

Tairov Doston Rustamovich

Yarmukhamedova TCodat Habibovna

Nazarov Feruz Yusufovich

MONOGRAPH

India - 2022

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AH	Arterial hypertension
ABP	Arterial blood pressure
MI	Myocardial infarction
LVMMI	Left Ventricular Myocardial Mass Index
BMI	Body mass index
SI	Severity Index
CD	Cardiovascular diseases
CHLV	Concentric hypertrophy of the left ventricle
LVEDV	Left ventricular end-diastolic volume
LVIRT	Left ventricular isovolemic relaxation time
WHO	World Health Organization
NLVG	Normal left ventricular geometry
MS	Metabolic syndrome
DABP	Diastolic arterial blood pressure
LVMM	Left ventricular myocardial mass
UA	Uric acid
LV	Left ventricle
LVESV	Left ventricular end-systolic volume
IHD	Ischemic heart disease
LVDD	Left ventricular diastolic dysfunction
HY	Hyperuricemia
TC	Thigh circumference
TSLVD	The size of the left ventricle at the end of diastole
CRLV	Concentric remodeling of the left ventricle
RTLVW	Relative thickness of left ventricular wall
CRL	Coronary Risk Level.
SABP	Systolic arterial blood pressure

INTRODUCTION

The medical and social relevance of gout disease in the world is explained by the year-by-year increase in the incidence rate among the population, the decrease in the ability of patients to work, and the increase in disability indicators. In developed countries, "...1% of middle-aged men get sick with gout... it has been found that the incidence of gout has doubled in the last 30 years"1. At present, early diagnosis of damage to the cardiovascular system in patients with gout and prevention of severe complications of the disease, taking into account the pathogenetic aspects of the treatment, and reducing the number of recurrences of the disease, are among the problems that need to be solved in medicine.

In the world, a number of scientific researches aimed at improving the methods of diagnosis, treatment, and prevention of the comorbid heart and blood vessel damage in gout disease in the early stages, identification of the factors causing and worsening the disease are being carried out. In this regard, it is of particular importance to carrying out scientific research aimed at improving the complex of measures to determine the spread of cardiovascular and joint diseases in gout, their risk factors, the amount of uric acid in the blood, the quality of life of patients, as well as the implementation of effective treatment procedures.

In our country, comprehensive measures aimed at the development of the medical field, and adaptation of the medical system to the requirements of international standards, including early diagnosis, effective treatment, and prevention of damage to the cardiovascular system in gout among the population are being implemented and certain results are being achieved.

«…The tasks of improving the quality of specialized medical care provided to the population in our country, further reforming the system of rapid and emergency medical care, and preventing disability..."2 have been set. Based on these tasks, the clinical course of cardiovascular damage in gout and its relationship with the main disease severity index, high cumulative coronary risk, the prognostic significance of structural and functional changes of the left ventricle, as well as improvement of diagnostic and treatment measures will allow to reduce the disability caused by complications of the disease.

Compliance of the research with the priorities of the development of science and technology of the republic. This study is part VI of the republic's science and technology development. It was carried out within the priority direction "Medicine and pharmacology".

In the leading scientific centers of the country, a number of scientific researches are being carried out aimed at the close connection of gout disease with the disturbance of metabolic processes in the body and the frequent occurrence of comorbid conditions. According to the World Health Organization, gout is listed along with obesity, arterial hypertension, type 2 diabetes, and metabolic syndrome. In particular, according to MS Yeliseev and other authors, 65% of gout patients die due to cardiovascular complications. In this case, atherosclerotic changes take the main place on the basis of cardiovascular complications. The results of many completed epidemiological studies show a high incidence of cardiovascular damage in patients with gout (W. Sulaiman, N.W. Md Zuki, N. Zamri Arun Kumar [et al.] 2019; I.S. Denisov, M.S. Eliseev, V.G. BarUAova-2013 .). Taking into account these circumstances, it can be Said that the combined development of cardiovascular damage, metabolic syndrome, and gout causes premature diTCbility and early death as a result of various complications in a specific patient.

Today, extensive studies are being conducted on the prevalence, diagnosis, and clinical course of gout throughout the world, as well as in the CIS countries. Despite the clarity of the clinical symptoms of the disease and the improvement of

diagnostic methods, V.A. According to Nasonov and his co-authors, the diagnosis of gout takes an average of 8 years (V.A. Nasonova, V.G. Barskova. 2018). The death rate from these diseases is 54-56%, and the disability rate is 40%. It is clear that cardiovascular damage is the main cause of death in gout (V.G. Barskova, I.S. Denisov, M.S. Eliseev. 2013). According to modern concepts, hyperuricemia is the main risk factor for cardiovascular diseases and death in patients with arterial hypertension. (T. Bardin, P. Richette. 2017; M.N. Essex, M. Hopps, E.J. Bienen [et al.]. -2017).

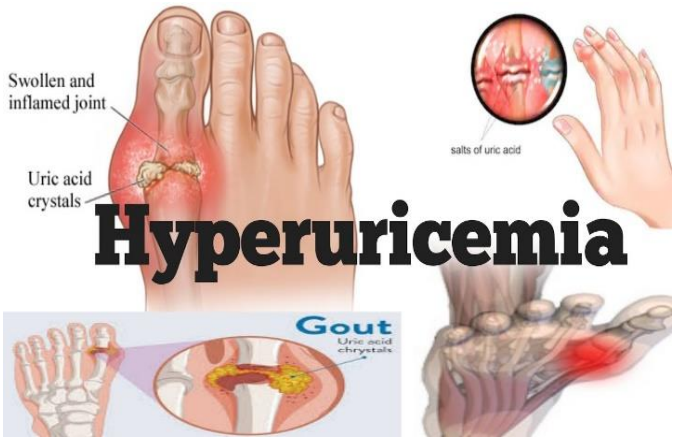
A number of scientists, including prof. T.S. Soliev, prof. Toirov E.S, academician Alyavi A.L, prof. Kayumov is U.K. In most cases, gout is accompanied by AG, metabolic syndrome (MS), and type 2 diabetes (Kayumov U.K. 2019). In these diseases, high-level cardiovascular complications occur due to atherosclerotic lesions in blood vessels (Alyavi A.L. 2020).

Despite the fact that much attention has been paid to the study of gout disease in recent years, in modern investigations one of the most serious complications of the disease - clinical, laboratory, and instrumental signs of cardiovascular damage, the severity of the main disease and the co-occurrence of these damage with other accompanying diseases little attention is paid. Solving these problems will help to improve the effectiveness of gout treatment and prevent disability, which is one of the main tasks of health care. Based on the above, improving the principles of prevention, diagnosis, and treatment of gout is considered the most important problem of modern medicine.

The role of hyperuricemia in the development of cardiovascular damage in gout

Gout is a systemic tophus disease characterized by the accumulation of moderate sodium (MUN) crystals in tissues and the formation of an inflammatory process Against the background of hyperuricemia (HY). The importance of external factors and genetic predisposition in the development of the disease is high [112]. Nasonov V.A. as described, MUN crystals are directly associated with

hyperuricemia (HY) and form crystal clusters of various sizes and shapes, these crystal clusters are scientifically known as tophus. From the early stages of the disease, it is possible to detect small MUN crystal clusters in organs and tissues, as the disease progresses, MUN crystal clusters merge to form large MUN crystals-macrotophus, macrotophus in the joints and above the ear often located. Accumulation of MUN crystals in any organs and tissues is the main criterion in the diagnosis of the disease [111]. Considering this, it can be said that the basis of the development of the disease is the body's inflammatory reaction against MUN crystals.



Despite the clarity of the clinical symptoms of the disease and the improvement of diagnostic methods, In the investigations of V.A. Nasonov and authors, the diagnosis of gout takes an average of 8 years[112].

Men suffer from gout 3-4 times more often than women, this proportion changes with age, the main reason for this is the decrease in the estrogen hormone, which has uricosuric properties in the female body [16,86,166].

According to several researchers, the incidence of gout has doubled in the last 10-20 years [16,166]. Among Western countries, more than 1% of adults have gout [28, 86, 127, 154], which is one of the leading causes of joint damage in the middle-aged population [19, 28,39].

According to the information provided by BJSSB, the death rate from cardiovascular diseases remains high among the developed countries of the world. Among cardiovascular diseases, the percentage of arterial hypertension and ischemic heart disease is the highest. The death rate from these diseases is 54-56%, and the disability rate is 40%. It is not a secret to anyone that obesity, arterial hypertension, dyslipidemia, and IHD accompany gout disease [23,154].

Cardiovascular damage is the main cause of death in gout [58,122,150,162]. In several studies, it has been found that 2 out of 3 (2/3) of the death rates in gout are cardiovascular insufficiency associated with atherosclerosis, and only less than a quarter are chronic renal insufficiency [121,138].

Gout often co-occurs with AH, metabolic syndrome (MS), and type 2 diabetes. In these diseases, due to atherosclerotic lesions in blood vessels, high-level cardiovascular diseases occur [102,35,72,101,66,93,139,90,159].

According to several studies, AH was observed in 36 to 41% of patients with gout. If the disease is accompanied by metabolic syndrome, we can see that the increase in arterial blood pressure (ABP) increases up to 72% [139,115,159,134]. R. Grahame et al. studies show that patients with gout often have poor-quality hypertension, which is often observed in the second decade of the disease. In a study conducted in Mexico, arterial hypertension was the highest rate among patients with primary gout (67.2%)[159].

When studying the medical histories of patients treated with gout at the rheumatology center in Tula, 91% of them had a high level of ABQ. In this case, 78 out of 98 patients who were in the period of the disease had stable high systolic blood pressure, after the disease attack, stabilization of the blood pressure was observed [18].

Cardiovascular disease and changes in uric acid (UA) levels have been denied for many years. Only in the 1950s and 1960s and by the 2000s, it was discussed AHain [20,48,172]. Since then, in several epidemiological studies, it has been mentioned that the level of uric acid in the blood plasma is related to the development of the disease [83, 48, 51, 151]. In addition, it was found that before the era of effective treatment of gout, the disease was accompanied by obesity in 70% of cases, AH in more than 50% of cases, and various types of cardiovascular damage in approximately 90% of patients. In this case, 20% of patients who have heart died of vascular insufficiency [64]. By the present time, several pathogenetic mechanisms have emerged regarding the importance of uric acid in cardiovascular

damage. RJ Johnson et al. in experiments conducted on animals, a small increase in the amount of SC in the blood significantly increased the activity of the renin-angiotensin system, causing glomerulotubular damage. After the elimination of hyperuricemia, normalization of ABQ has been observed AHain [70]. L. G. Tcnchez-Lozada and others. by studying the model of afferent arterioles of mice, it was observed that the high level of UA leads to vascular damage, and when using the drug allopurinol, the amount of uric acid is normalized and vascular damage is eliminated [129]. In addition, hyperuricemia causes the narrowing of renal blood vessels and increases the activity of the renin-angiotensin system. Hyperuricemia leads to dysfunction of the vascular endothelium [94,129,167]. Free radicals in hyperuricemia activate the peroxidation of lipids involved in the thickening of the middle intima of the carotid artery, resulting in the thickening of the vascular intima of the carotid artery [94]. Several studies have shown that the elimination of hyperuricemia leads to a dramatic reduction in cardiovascular disease. One of these trials was LIFE (LoTCrtan Intervention for EndpSInt in Hypertension), which compared uricosuric drugs loTCrtan and atenolol [65]. Multivariate analysis showed that the amount of uric acid decreased by 29% in patients who received loTCrtan. This has led to a sharp decrease in the rate of cardiovascular diseases and death. Some scientists have shown that the use of allopurinol, a xanthine oxidase inhibitor, reduces endothelial dysfunction, reduces aortocoronary shunting, dilated cardiomyopathy, and cardiovascular complications in patients with congenital heart defects [141,163].

In a series of investigations, we can see that the excess of uric acid in the blood is one of the main risk factors for the increase of ABQ [60,92,107,108,120,133]. Some literature also mentions that the amount of uric acid in the blood is more than 60 μmol/l, which doubles the mortality rate from CHD and other cardiovascular diseases (48%) [46,113].

Other studies also suggest that uric acid is an important but independent cardiovascular risk factor [32, 84, 160]. It is mentioned by many scientists that it is

important to determine the amount of uric acid in the plasma in determining the risk factors for the development of cardiovascular diseases [145, 119].

Although there is no clear evidence that gout is one of the risk factors for cardiovascular diseases, scientists say that it is important to determine the risk of cardiovascular diseases even when presenting with gout for the first time [69]. According to M.R. Hayden, the amount of uric acid in the blood plasma of more than 4 mg/dl (240 μmol/l) should be considered a "red flag" in patients with cardiovascular diseases. In such patients, this risk factor is considered one of the main atherogenic factors, and the implementation of preventive measures significantly reduces the risk of death [63].

It was found that in patients with hyperuricemia, increased ABQ (25-50%), kidney diseases (20-60%), and various cardiovascular diseases (90%) are observed more than in the general population [120].

Several clinical studies show that high levels of uric acid in the blood are not directly related to cardiovascular disease morbidity and mortality but is an important risk factor[26,174,11,74,46]. The study of the pathogenesis of cardiovascular damage in patients with gout has become the main object of investigation in recent years.

Several large epidemiologic studies have shown a close relationship between hyperuricemia and cardiovascular disease, in which increased uric acid levels are considered a major risk factor for cardiovascular disease[1,106,73,40,62,32,20 ,46,109].

Increased platelet adhesion and aggregation, increased free radicals, decreased antioxidant properties, and increased ABQ are believed to be mechanisms of dependence of uric acid levels in cardiovascular damage, but the exact mechanism has not yet been developed [73,75,92, 70].

In patients with cardiovascular insufficiency, an excess of uric acid is considered a sign of bad consequences [1,106,145]. Urinary cysts in patients with angiographically confirmed LUIK it was observed that the high amount of lota

increases the risk of death up to 5 times. It has been observed that an increase in the amount of SC in the blood plasma by 1 mg/dl increases the risk of death from cardiovascular diseases by 26% [22].

In J.D. Kabalova's investigations, the amount and characteristics of uric acid in patients with AH were studied [73], hyperuricemia was 37.8% in patients with arterial hypertension and metabolic syndrome, and 22% in patients with only AH without metabolic syndrome. In addition, very few changes in TCBP and DABP daily index were noted in patients with increased UA levels. In this case, a direct correlation between the increase in QB and the amount of uric acid was determined. When checking the correlation between the amount of daily ABQ and SC, it was mentioned that if the amount of SC in the blood plasma exceeds 300 μmol/l, it not only leads to an increase in metabolic disorders in the target organs, but also to an increase in daily arterial blood pressure indicators.

Mazzali.M et al. in mice studies, a slight increase in the amount of uric acid in blood plasma led to an increase in arterial blood pressure within 3-5 weeks [93]. The main mechanisms of blood pressure increase during hyperuricemia are the decrease in the activity of endothelial nitric oxide and neuronal NO-synthase in nephrons, resulting in the activation of the RA system[128]. After some time, microvascular changes began to be observed in the kidneys, thickening of the incoming arteriole, and, as a result, hyalinosis. Changes in renal vessels occurred independently of ABQ, from which we can conclude that uric acid directly induces the proliferation of smooth muscle cells in the vascular wall [94,168]. This information is confirmed by the fact that despite the normalization of ABQ with diuretics, changes in vascular endothelium and smooth muscle cells were not eliminated [49,77]. From these investigations, it can be concluded that the main reasons for the increase in ABQ in patients with gout are not only the amount of SC but also damage to the renal vessels [82].

Studies conducted in humans also explain that, in fact, in gout, an increase in ABQ, damage to the vascular endothelium due to hyperuricemia, and an increase in

the amount of renin in the plasma [30,38,96], in this case, a decrease in the amount of uric acid improved the functional condition of the endothelium [25,47,58].

TS Perlstein et al. In a study of the effect of SC on ABP[168], if the plasma SC content was >7 mg/dl, as a risk factor for elevated ABP (1.36), if the plasma content was >6.5 mg/dl in the amount of 1.34, it is considered as a relative risk factor of ABQ increase. During the examinations, 892 out of 2062 patients (43.3%) had a high content of UA in the blood plasma and high ABQ in these patients. During the examinations, the renal glomerular filtration rate was also studied in patients whose blood plasma content of SC was higher than 7.5 mg/dL. In this case, an inverse correlation was observed between SC and KFT in the blood plasma.

In the studies of K. Masuo and colleagues, an increase in the amount of UA in the blood by 1 mg/dl for 5 years led to an increase in TCBP by 27.5 mm.sim.ust and DABP by 15.2 mm.sim.ust.

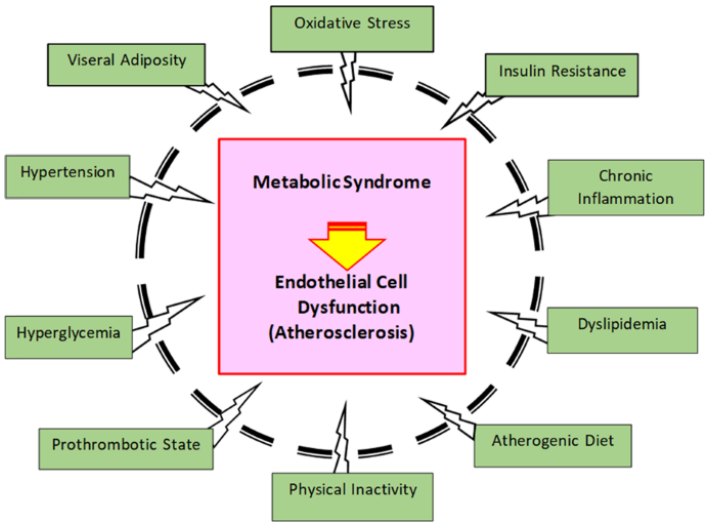
J. Sundstrom and colleagues found that if the level of UA in the blood plasma of patients is higher than 1 standard indicator (77 μmol/l) during the last 4 years, the risk of ABQ increases by 17-29%[133].

R.D. Abbott and colleagues found that patients with gout have a 60% higher risk of developing LUKI (59). E. Krishnan and colleagues (2006) conducted a multifactorial study and found that patients with gout had a 25% increased risk of the acute coronary syndrome[80]. H.K.ChSI and his colleagues reported similar data: patients without a history of coronary artery disease have a 28% higher risk of death from coronary artery disease. Of these, 38% of deaths are caused by cardiovascular damage and 55% by myocardial infarction (MI)[86]. In patients with gout, the main part of the death rate in the case of severe gouty kidney disease developed in disease is caused by cardiovascular diseases [156]. In the investigations carried out by N.F. Lee and co-authors, high ABQ on the background of HY was observed 3-5 times more than the high ABQ in the case of IHD and cerebral blood vessels, and high ABQ in normal uricemia [146]. In addition, several studies have

shown that gout is a major risk factor for non-fatal myocardial infarction the vf factor [83,80,24].

In addition, now there is some evidence about the importance of HY in coronary calcinosis. E. Krishnan and colleagues studied this problem in 2498 healthy patients with HY[81]. When these data were determined by computer tomography, the increase in the amount of UA in the blood plasma led to an increase in the calcinosis process in the coronary vessels. From these investigations, it was concluded that HY is a risk factor for subclinical atherosclerosis in middle-Aged people.

The distribution of subclinical atherosclerosis in patients with gouty arthritis was studied by S. HYkurova and colleagues[59]. Regression analysis shows that the age of the patient and the presence of tophi are direct risk factors for the development of atherosclerosis..



Metabolic syndrome and additional diseases associated with cardiovascular damage in gout.

HY often coexists with MS [8,102,68], and several manifestations of this pathological condition can be seen, including intermediate states, renal damage, development of insulin resistance, and endothelial dysfunction, for example. possible [139,78,171]. High levels of glucose and insulin in the blood create a favorable environment for the development of HY, and studies conducted by most scientists have found that high levels of fructose in the blood by themselves lead to and/or Aggravate kidney failure [55,56]. In view of this, a number of researchers came to the opinion that if the patient has metabolic syndrome, not only the amount

of SC is important for the development of kidney diseases, but also the above-mentioned factors play an important role[76].

J.P. Forman and colleagues concluded that SC levels, insulin sensitivity, and endothelial dysfunction all together are the main causes of AH development[53]. It has been studied that persistently high levels of uric acid in the blood plasma always precede the appearance of insulin resistance[142]. Studies show that patients with a normal body mass index and hyperuricemia greater than 10 mg/dL have a 10-fold higher incidence of metabolic syndrome than patients with a normal body mass index and hyperuricemia less than 6 mg/dL[148].

Constant hyperinsulinemia in the blood reduces the excretion of water, sodium, and uric acid from the body by increasing the activity of the sympathetic nervous system[49]. Taking these into account, it can be Said that the high level of uric acid in the blood plasma is one of the main components of the metabolic syndrome, and hyperuricemia is pathogenetically related to other components of the metabolic syndrome, including AH [82,172].

In the research conducted by X. Sui and colleagues, comparing patients in the HY environment ($\geqslant$6.5 mg/dl) and, conversely, patients with uric acid content in the blood plasma $\leqslant$5.5 mg/dl, the metabolic rate in the HY environment syndrome was observed 1.6 times more often. In a study conducted among women, the risk of developing metabolic syndrome was more than 2 times greater in the case of uric acid content in the blood plasma of 4.6 mg/dL or more.

J.G. When 1344 residents of Madrid were examined by Puig and colleagues, the increase in the components of the metabolic syndrome decreased in parallel with the increase in the amount of uric acid in the blood. In addition, a direct correlation between the abdominal circumference and the amount of uric acid was noted. Taking this into account, it can be said that the high level of uric acid in blood plasma is one of the main pathogenetic components of AH and MS, even in the absence of disease symptoms.

We know that for many years there is a link between hyperuricemia and kidney diseases, but scientists have been ignoring the fact that urate Salts are the direct cause of kidney dysfunction. In several studies conducted in humans and animals, there were cases of microvascular damage in the arterioles entering the kidney against the background of hyperuricemia. These investigations brought the importance of urate Salts in the pathogenesis of chronic kidney disease to a new era [143,31,76,114]. However, it should be mentioned that there is still no single conclusion about the mechanism of action of uric acid in the development of the gouty kidney[91,131].

Kidneys are damaged in 30-50% of cases of gout, in some literature, this is 75%. In 10-25% of cases, it is Said that death occurs from this disease[104].

When a radiSIsotope X-ray examination is performed, we can observe kidney damage in 93% of cases Against the background of hyperuricemia. A steady increase in the amount of uric acid in the blood plasma of 8 mg/dl increases the risk of developing chronic kidney failure by 3-10 times. Every fourth patient with gout has chronic kidney failure.

A high level of uric acid in the blood plasma under the influence of urate salts causes kidney interstitial deposits and causes tubulSInterstitial nephritis. In addition, there are cases of acute kidney failure due to the formation of uric acid crystal plugs in the renal tubules (acute uric acid nephropathy)[136].

An increase in UA excretion through the kidneys is a risk factor for the development of urate salts nephrolithiasis. Urate stones are detected in almost half of gout patients. Pathological conditions in the kidneys during the development of urolithiasis, for example, interstitial nEphrite development is considered to be a certain important factor [104].

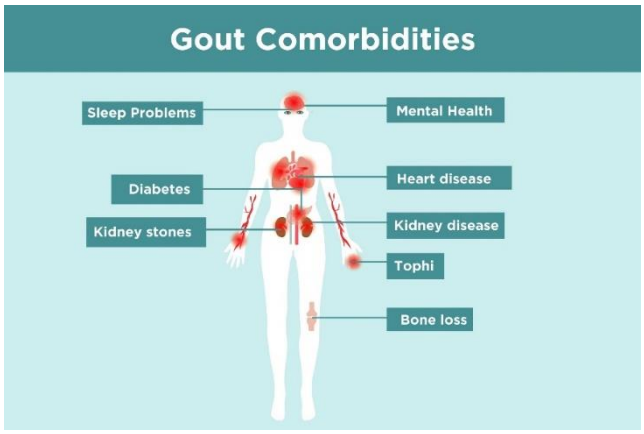
M. Tomita and colleagues conducted a 4-5 year cohort study of 49,413 men aged 25 to 60 years in Japan on the role of urate Salts in causing other diseases. In their investigations, it is determined that there is a direct correlation between the amount of SC and kidney failure. In this case, the risk of developing kidney failure

was 8 times higher when the SC level was >8.5 mg/dL and higher than people with an SC level of 5.0-6.0 mg/dl.

We can see that the importance of HY status in kidney damage has been mentioned in many pieces of literature, but we can still observe many unanswered questions. This is primarily the importance of metabolic syndrome and other comorbid conditions in the development of kidney damage in gout.

Risk factors of cardiovascular damage in gout

In the presence of arterial hypertension, the outcome of the disease is directly proportional to the degree of damage to the target organs and the presence of risk factors. It is important to consider each of the cardiovascular risk factors in patients with gout [18].



Studies show that 70% of gout patients have two or more cardiovascular risk factors[2], such as dyslipidemia, AH, QD-2 type, insulin insensitivity, obesity[45,43, 90,105,40,61,56]. In this case, the combination of risk factors, even if they are less pronounced, is more dangerous than the obvious development of one risk factor[106,171]. The largest and most important is YUQTZ XO, which is the size of the male gender and Age [100]. For example, in a long 12-year study of more than 14,000 women and men Aged 25-60 years in Finland, it can be seen that YUQTZ was 3 times more common in men than in women. and the indicator is 5 times more.

The main risk factor is the increase of ABQ, especially the increase of TCBP [145, 37, 54, 88, 97]. Studies show that up to the Age of 50, CAD is the highest risk factor, and in people Aged 60 years and older, the highest risk factor is increased arterial pulse pressure[54]. Dyslipidemia, which leads to atherosclerotic changes and consequent damage to blood vessels, is among the risk factors for CHD [172,174].

An increase in the amount of cholesterol in the blood plasma is proportionally related to an increase in LUQTZ[39].

In recent years, the high importance of type 2 QD (impaired insulin sensitivity, hyperinsulinemia) in the origin of YUQTZ in patients with gout disease has been widely studied[17,117,157]. For example, a CopenhAgen study of 1,300 patients showed a 2- to 3-fold higher incidence of MI and stroke in patients with QD type 2, and a 2 observed more times. Considering this, it can be Said that patients with type 2 QD are included in the group of patients with high cardiovascular risk factors. Patients with type 2 QD (such as patients with gout) also have a high frequency of other risk factors (AH, obesity, dyslipidemia).

Obesity is a risk factor that is pathogenetically closely related to the risk factors of CKD, AH, insulin sensitivity, and dyslipidemic disorders [85,36]. According to epidemiological studies, the body mass index is directly correlated with the amount of uric acid in the blood [100]. Patients with metabolic syndrome and type 2 diabetes are the main risk factors for the development of atherosclerosis [85, 116, 124, 130]. These data indicate that a number of risk factors are closely related in patients with metabolic syndrome, each of these risk factors leads to the development and exacerbation of atherosclerotic processes [28,50,170].

In most cases, dyslipidemia in gout is associated with impaired insulin resistance and hyperinsulinemia[171]. A study conducted by S. Takahashi and co-authors on 175 men with gout showed that compared to healthy people, blood serum (a) lipoprotein content was higher in gout patients. This group of lipoproteins is considered a marker of hereditary dyslipidemia, considered one of the main important factors in the development of atherosclerotic processes and CHD.

Structural and functional changes in the myocardium in gout

When a number of patients with cardiovascular orphans are examined, we can see that the contractile activity of the heart is normal in a certain part of them. This situation can be explained by the fact that the basis of the development of cardiovascular insufficiency lies in the diastolic function [34,5]. Disruption of

diastolic function occurs in connection with its active filling (relaxation) and passive diastole[50,5,15].

It is known that arterial hypertension is one of the main causes of damage to the cardiovascular system, mainly the heart. In addition, CHD is a risk factor for chronic heart failure and death [86,88]. The most characteristic change of heart damage in patients with arterial hypertension is left ventricular hypertrophy [122, 5]. The main factors in the occurrence of left ventricular hypertrophy are mechanical (the systolic strain of the left ventricle, increased circulating blood volume, increased blood viscosity, increased total peripheral resistance, etc.) and neurohumoral (renin-angiotensin system and sympathoadrenal system) disorders. [21, 99]. In addition, a certain amount of excess body weight is also important in the occurrence of left ventricular hypertrophy[138]. According to a number of scientists, deficiency of macroergic phosphates is also highly appreciated in the occurrence of left ventricular hypertrophy and hypoxic changes [59,60].

Investigations in recent years show that hypertrophy of the left ventricle Against the background of arterial hypertension does not always lead to an increase in myocardial mass [59,110,1]. In most cases, in this situation, the geometric structure of the left ventricle changes, and while the normal myocardial mass is preserved, the internal volume of the ventricle decreases. Nowadays, instead of the concept of ventricular hypertrophy, the term "remodeling" is widely used, and left ventricular hypertrophy is considered a form of remodeling [47,62,50].

It has been confirmed that there is a relationship between purine metabolism disorders and myocardial damage [19,14].

It was found that there is a direct relationship between damage to the myocardium and purine metabolism disorders [14,19,7,82]. The development of gouty heart myopathy is explained by heart defects caused by the occurrence of IUD as an additional disease or the accumulation of urate salts in the heart valve apparatus [126,164].

Information about heart diastolic function and myocardial remodeling process in primary gout disease can be found in many pieces of literature and in some cases contradict each other. Research data on target organ damage in patients with AH and patients with high levels of SC in the blood also do not provide the TCme results. Several studies have investigated the association of HY status with disorders of the MMLJ and several other organs [105,39,29,140,99]. Other authors were unable to determine the association of UA levels with MMLJ, coronary disorders, or microalbuminuria[12,1,3].

The characteristics of heart damage in gout are studied in the investigations conducted by O. V. Sinyachenko and co-authors. The results show that in 82% of patients, heart damage of various degrees is detected in ECG and ExoKG examinations. 43% of patients had left ventricular hypertrophy, and 62% had left ventricular hypertrophy. In the ExoKG examination, on average, damage to the heart valve apparatus was observed in 70% of patients, including thickening of the interventricular septum in 50% of patients, thickening of the posterior wall of the left ventricle in 44% of patients, left ventricular hypertrophy in 36% of cases, left ventricular hypertrophy in 31.5% of cases. diffuse ventricular dilatation was observed. Similar results are noted in the investigations of N.N. Kushnarenko [74] and O.A. Sherbakov [138].

Taking this into account, it can be said that organic and functional changes in the cardiovascular system in gout are still problems that have not been fully explored and require solution. In addition, the course of the disease and the changes in its target organs, mainly the CNS system, against the background of AH remain abstract.

Nowadays, gout disease is considered a general medical problem not only because of the wide spread of the disease but also Against the background of HY in it, it goes with the gastrSIntestinal system, kidney damage, and metabolic syndrome. Taking into account the current requirements, a special approach is required for each of these patients. During the treatment of the disease, it is necesTCry to pay attention

to such factors as early identification of risk factors, consideration of additional diseases in the treatment process, improvement of living conditions of patients, and reduction of hospitalization days. During the treatment of patients, screening of the cardiovascular system and elimination of complications helps to reduce the death rate from the disease.

The co-occurrence of cardiovascular damage (arterial hypertension and IUD) in gout disease helps to study these diseases not in isolation, but in relation to each other, the rate of death due to diseases, and early elimination of dangerous complications. The development of a perfect approach to treatment and early detection of complications caused by diseases in such patients is the need of the hour.

General characteristics of the examined patients.

Examination and treatment of patients were carried out in the consulting polyclinic, cardiology, and rheumatology departments of the 1st clinic of the TCmarkand State Medical Institute, in the polyclinic No. 3 of the city of TCmarkand, in the cardiology dispenTCries of the TCmarkand region. 105 patients with gout were examined. The criteria of the American College of Rheumatology (ACR, 1977) were used to diAHnose patients. Collection and transportation of patients for examination were carried out in 2015-2021.

The average Age of the patients was 55.9±8 years (from 29 to 74 years). 14.28% under 43, 56.2% between 44 and 58, 27.6% between 59 and 73, and 1.9% over 74. The average Age of the patients at the onset of the disease was 44.8±8 years. In most patients (71.1%), the onset of the disease was observed in the Age range of 35-52 years.

The average duration of the disease at the time of presentation was 7.2 (1.0; 21.0) years.

The general description of patients by Age and disease duration is presented in Table 1.

1-Table

General characteristics of patients with gout

Indicators	**Number indicators**	
	n	**%**
Patients by Age		
General	105	100,0
Up to 43 years old	15	14,28
44-58 years old	59	56,2
59-73	29	27,62
74 years and older	2	1,9
By duration of illness (years)		
less than 1	16	15,23
2-5	44	41,9
6-10	22	20,95
More than 10 years old	23	21,9

Patients using diuretic drugs, patients with severe renal failure, patients with severe pulmonary-cardiovascular and heart failure, and patients with oncological diseases were not included in the examination.

When the patient's anamnesis is aUAed, the presence of symptoms of arthritis before the diAHnosis of the disease is noted. Acute gouty arthritis was noted in 28 26.7% of patients at the time of primary examination, in 12 patients (11.4%) arthritis was found to be prolonged (from 3 weeks to 3 months), and in 29 patients (27.6 %) showed signs of chronic arthritis (lasting more than 3 months).

In the last year of the disease, relapses averaged 3.0 (1.0; 6.0) cases. Also, during the last year, 98 patients (93.3%) had 1 to 6 attacks of arthritis, and 7 (6.7%) had 6 to 9 attacks.

The general characteristics of the jSInt syndrome are presented in Table 2.2. This was done according to the classification of M.G. Astapenko and E.G.Pixlaka. 53.3% of patients had symptoms of recurrent arthritis and 46.7% of chronic arthritis.

The average Age of patients with relapsing arthritis was 52.6±8.8 years, and the average Age of patients with chronic arthritis was 57.2±8.7 years. The average duration of jSInt attacks was 1-3 weeks.

During the average disease, 9 (5; 13) jSInt lesions were noted. In 72 patients (68.57%), 11 jSInts were damaged during the disease, and in 33 patients (31.4%) 11 to 28 jSInts were damaged.

Subcutaneous tophi were detected in 46 patients (43.8%), the average number of tophi was 6 (from 1 to 19). X-ray bony tophi were found in 76 (72.38%) patients.

2- Table

Frequency of jSInt syndrome in patients with gout (n=105)

Indicators	**Frequency of injuries**	
	n	**%**
Character of arthritis		
- relapsed	56	53.3
-chronic	49	46.7
Arthritis type		
- monoarthritis	26	24.7
- oligoarthritis	14	13.3
- polyarthritis	65	61.9
Duration of jSInt attack		
5-7 days	11	10.47
8-21 days	63	60.0
22-30 days	24	22.3
1-3 months	7	6.7
Number of attacks during the year		
1-2	36	34.28
3-5	56	53.3
6 and above	13	12.38
X-ray stAge		
I	11	10.47
II	63	60.0
III	24	22.3
	7	6.7

During the examination, the number of patients who consumed uric acid reducing Agents (allopurinol) was 35 (33.3%). The duration of treatment was from 1 week to 1 year.

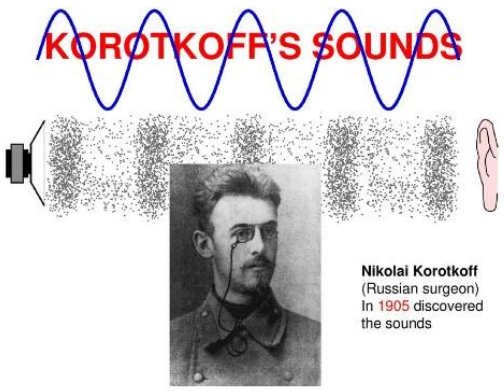
During the examination of patients, it was found that additional diseases, especially cardiovascular diseases, were recorded many times in them. However, only 41.5% of patients with AH used antihypertensive drugs. . Among patients, only 30% of patients had chronic renal failure and type 2 QD. Only 14% of patients with QD used hypoglycemic drugs.

3-Table

Additional diseases of gout patients and their level of knowledge about these diseases (n=105).

Diseases	n(%)	The level of awareness of patients about the disease %
Arterial hypertension	76(72,38)	90
IHD	40(38,09)	89
History of STDs	10(9,52) 4(3,8)	100 100
-myocardial infarction	24(22,587)	86
- stroke	29(27,8)	31
Chronic heart failure	21(20)	32
Chronic kidney failure	56(53,3)	30

Nosological diahnosis



ABQ was determined by the Korotkov method using auscultation. ABQ was determined by measuring 3 times, each QB measurement interval was 5 minutes. In this case, the examination was carried out while the patient was lying down or sitting, and the patient's hand was placed in the TCme plane as the axis of the heart. Patients who did not use antihypertensive drugs were diahnosed with AH

according to the criteria of WHO/MOAH (1999) (where TCBP⩾140 mm.sim.ast. DABP⩾90 mm.sim.ast).

During the examination, arterial hypertension was detected in 76 (72.38%) patients. Arterial blood pressure average height level systolic arterial blood pressure (TCBP)-147.2±14.0 mmHg, diastolic arterial blood pressure (DABP)-96.0±9.4 mmHg, pulse pressure was 51.8±8.6 mm.sim.ust.

The diAHnosis of IHD was made based on the patient's medical history, general examination, ECG, and ExoKG examinations. The diAHnosis of myocardial infarction was made before the patients were admitted to the hospital, and this information was confirmed by the extract from the medical histories brought by the patients and ECG examinations. The diAHnosis of IHD was made based on the criteria of 1979 of BJSST and 1984 filled by VKNS.

YUCK was detected in 40 (38.09%) patients, of which 10 (25%) patients were diahnosed with MI. In 30 (75%) patients, I-III functional classes of stable angina pectoris were noted, and only 4 (3.8%) patients had cerebral circulation disorders in their anamnesis.

Chronic heart failure was diahnosed based on the diAHnostic criteria developed by the New York Cardiology Association (1995). SYUE I-II FS was diahnosed in 24 (22.86%) patients.

Metabolic syndrome was diahnosed based on the criteria developed by the US National Institutes of Health (2001). Metabolic syndrome was confirmed if at least 3 of the following criteria were met:

- waist circumference >102 cm;

- triglycerides ⩾ 1.69 mmol/l;

- YUZLP <1.6 mmol/l;

- TCBP ⩾ 135 mm.sim.ust and/or DABP ⩾ 85 mm.sim.ust;

- fasting blood glucose level >6.1 mmol/l;

Metabolic syndrome was noted in 56 (53.3%) patients.

Patients were diahnosed with carbohydrate metabolism disorders and diabetes based on the BJSST (1999) diAHnostic criteria. 6.12 mmol/l or more sugar content in the blood, and 7.11 mmol/l or more sugar in the blood plasma was taken as the main diAHnostic criterion. Among the patients, the diAHnosis of QD type 2 was determined in 21 (20%) patients.

Along with general clinical examinations, anthropometric examinations were also performed on the patients. Waist circumference (BA) and hip circumference (TC), their ratio (BA/TC), height, and weight were determined in patients. Body mass index (Kettle index) kg/m2 was calculated.

Patients' waist circumference and hip circumference were measured in a standing position from the middle third of the thigh and the umbilical region of the abdomen using a cm tape. Patients' hip circumference of 94 cm or less was compared to the norm. A ratio of BA/TC of 1 or more was considered visceral obesity. Patients with a body mass index of 18.5 to 24.9 kg/m² were compared to the norm, those with a body mass index of 25 to 29.9 kg/m² were more than normal, those above 30 kg/m² were obese, 40 kg/ m² and higher was considered extreme obesity.

Among the patients, 25 (65.78%) grade I obesity, and II-III grade obesity was found in 9 (23.68%) and 4 (10.5%) patients, respectively.

Determination of cumulative coronary risk

Coronary risk assessment was performed using the HeartUAore 3.1 computer program. In this model, patients' Age, sex, XS, amount of YUZLP, smoking, TCBP and use and non-use of hypotensive drugs were studied. In determining the coronary

risk (KX), the percentAge indicators of the risk factors were summarized, where a certain risk factor is a certain percentAge. If KX ⩾ 20%, the risk of occurrence of IHD in the next 10 years was assessed as high, and if KX < 20%, it was low. Additional risk factors in patients (QD, TG content in blood plasma 2.3 mmol/l and higher, BMI⩾25kg/m2, presence of coronary artery disease and other atherosclerotic diseases in the patient's relatives (men younger than 55 years, women younger than 66 years) according to this model, it is determined that the coronary risk will increase by 2 times

4- Table

Anthropometric parameters of patients with gout (n=105)

Indicators	**Natijalar**
Height, m	1,73 (1,66;1,81)
Weight, kg	89,7(64;108)
BMI kg/m2	29,6 (20,6;35,2)
Distribution of patients according to body mass index 1. Standard (<25.1 kg/m2) 2. Excess weight (25.0-29.9 kg/m2) 1. 3. Obesity (⩾30 kg/m2)	 9(8,6) 58(55,23) 38(37,26)
Waist circumference, cm	103,8±12,2
Hip circumference, cm	102,6±9,1
BA/TC	1,012±0,06

Instrumental examination methods

All patients underwent ECG examination using a standard 12-lead Schiller CardioVit AT-1/ Type AT-1. Series 190.25068, 10 mV, 25-50 mm/s is conducted on an electrocardiograph.

Echocardiography the inspection was carried out on the device 400CL, sensor S 364, 3.3/D2 5 MG. In all patients, the systolic and diastolic functions of the

left ventricle, the stroke volume of the left ventricle, and the condition of the heart chambers after systole and diastole were studied. We determined the myocardial mass of the left ventricle (LVMI) by the Simpson "area-length" method. The left ventricular myocardial mass index (LVMI) was determined by the ratio of body area to LVMM using the D. Dobios formula.

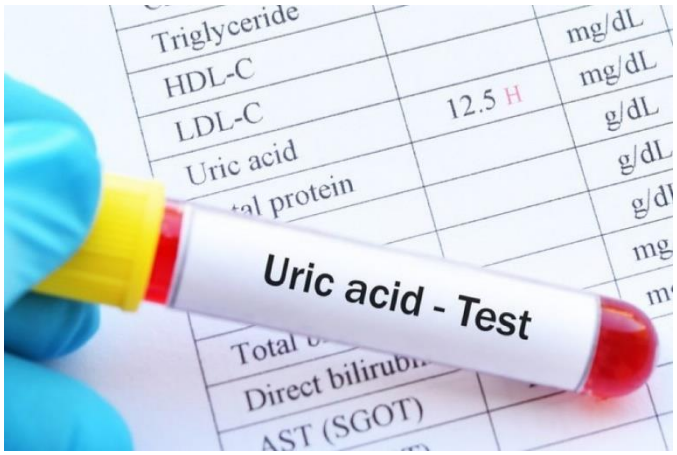
The following geometric shapes of the left ventricle were determined by determining the relative thickness of the left ventricular wall (LVMMI) and the relative thickness of the left ventricular wall:

- normal geometry - LVMMI⩽125 g/m2, RTLVW< 0.45;
- concentrically remodeled - LVMMI⩽125 g/m2, RTLVW⩾ 0.45
- concentric hypertrophied- LVMMI>125 g/m2, RTLVW⩾ 0.45
- eccentrically hypertrophied- LVMMI1>25 g/m2, RTLVW< 0.45

Indicators of LVMMI 125 g/m2 and more were included as criteria for left ventricular hypertrophy, which is the Framingham criterion.

In ultrasound examination all patients underwent kidney ultrasounds using Sonoscape S-50 (China), GE Logic F8 (UTC), and LOGIQ V2 (UTC) devices. The examination was carried out in three projections: lateral, abdominal, and dorTCl. Cuts were made lengthwise and widthwise.

X-ray examination All patients underwent an X-ray examination of the distal phalanges of the foot. The test was carried out in the standard method in the correct projection on the DRYSTAR5300+CR30-X and GFS501-2/3/4+GFS502-6/7/8 devices. During the X-ray examination, all patients were lying on their backs with their legs bent at the knees and ankles..



Laboratory test methods It was carried out in the general clinical laboratory of the TCmMI clinic. The amount of cholesterol in the blood plasma was determined by the colorometric enzymatic method, which is based on the enzymatic hydrolysis and oxidation method. Glycerides content of blood plasma was determined using glycerol-3-phosphate oxidase enzymatic colorometric method. The amount of YUZLPXS was determined using the sedimentation method and then under the influence of the enzymatic method. The amount of PZLPXS was calculated using the Friwald formula (PZLPXS=XS-(YUZLPXS+(TG/5)).

Determination of uric acid and sugar levels

The amount of uric acid in the blood plasma was determined by enzymatic colorometry. The level of uric acid in the blood plasma <4.6 mmol/l was considered as normouricemia.

Serum glucose was determined using the God-Pap enzymatic test by the glucooxidase method.

In all patients, general blood and urine analysis, blood content of liver enzymes, bilirubin, creatinine and urea were checked.

The results of the examination of patients are presented in table 2.5.

Physical examinations were completed on a specially developed card, in which, together with the main symptoms of the disease, special attention was paid to AH, IHD, QD, obesity.

Patients with gout were taken as the main object of investigation.

In the first part of the disease, 105 patients with gout were examined. The main goal was to determine the main cardiovascular risk factors in patients.

Patients were divided into two separate large groups: the first group consisted of patients with relapsing disease (n=56), and the second large group was considered to be chronic (n=49).

In addition, cardiovascular risk factors in gout patients were comprehensively studied depending on patient Age and BMI.

In the second part of the study, 44 patients were divided into 2 groups based on the course of the disease (1-relapsed (n=15); 2-chronic (n=29)) =31) and patients with normal blood pressure (n=13) were analyzed separately.

5-Table

Laboratory characteristics of examined patients (n=105)

Analyzes	**n(%)**
Hemoglobin, <132,0 g/l	17(16,23)
Leukocytes, >9,0×10^9/l	14(13,33)
Platelets, > 320,0×10^9/l	11(10.471)
ECHT,>10,0 mm/s.	50(47,62)
Uric acid,>417,0 mmol/l	90(85,72)
Glucose, >6,1 mmol/l	60(57,141)
Creatinine,>97,0 mkmol/l	33(31,42)
Urea,>8,3 mmol/l	6(5,713)
Total bilirubin, >20,5 mkmol/l	16(15,233)
ALT, > 40,0 ED/l	29(27,63)
AST, >38,0 ED/l	7(6,72)
XS, >6,6 mmol/l	70(66,74)
TG, >2,3 mmol/l	54(51,423)
YUZLPXS, <1,6 mmol/l	72(68,573)
PZLPXS, >4,95 mmol/l	49(46,73)

JSInt syndrome in patients with gout

105 gout patients Aged 29 to 73 were taken for examination.

The average Age of the patients at the onset of the disease was 46.9±9.22. In most patients (71.1%), the disease began between the Ages of 35-52. Among the

examined patients with gout, the earliest onset of the disease was 29 years old, and the latest onset was 73 years old.

The average duration of the disease at the time of application was 7.2 years (from 2 months to 38 years).

In most patients, the disease started from damage to the foot jSInts: in 80 (76.19%) patients, the disease started from damage to the big toe, in 16 (15.23%) patients, from the ankle jSInt, in 6 patients In (5.7%) patients, the knee jSInt was affected, and in 3 (2.85%) patients, the small jSInts of the feet were affected.

63 patients had polyarthritis. Monoarthritis and oligoarthritis were less common among patients, they were 27.5 and 12.5%, respectively. At the time of primary examination, 28 (26.7%) patients were diahnosed with acute gouty arthritis, 13 (12.74%) patients were diahnosed with prolonged arthritis symptoms (from 3 weeks to 3 months), 29 (27, Arthritis was chronic (more than 3 months) in 8%) patients and arthritis attacks were noted in 35 (33.3%) patients. The average number of attacks in patients with gout in the last year is 3.0 times. In 98 (93.3%) patients, the number of repeated attacks in the last year was found to be 1 to 6 times, and in 7 (6.7%) patients, these attacks were found to be 6 to 9 times.

The number of swollen jSInts averaged 3 (1;6) jSInts among patients, with a range of 1 to 28 jSInts among patients overall. it was noted that it was swollen.

The duration of the disease and the affected jSInts were studied by comparative analysis. The average number of jSInts damaged during the disease was 9 (5; 13), in general, we found that this indicator was damaged from 1 jSInt to 28 jSInts. All patients were divided into 3 subgroups: group I included patients with a disease duration of up to 5 years (n=44); Patients with a disease duration from 5 to 10 years (n=33) were included in group II, and patients with a disease duration of more than 10 years (n=28) were included in group III.

1: The number of affected jSInts according to the duration of the disease

As can be seen from 1, the number of affected jSInts in patients with a disease duration of up to 5 years is 5 (3;8), and the number of affected jSInts when the

disease lasts 5-10 years is 7 (6;12) and when the disease lasted more than 10 years, this indicator was 12 (9;19) ($p<0.001$ in both groups).

In other words, there is a direct correlation between the duration of the disease and the affected jSInts. The longer the disease lasts, the number of affected jSInts increases.

Among the examined patients, the majority were patients with relapses. 56(53.3%). In 49 (46.7) patients, we witnessed chronic arthritis.

Relapsed gout disease occurred in relatively young patients. Their average Age was 52.67±8.9 years, and the average Age of patients with chronic disease was 57.1±8.65 years ($p<0.05$). The duration of the disease in patients with the recurrent disease was on average 3.0 (1.0; 6.0), and in patients with chronic disease, the duration of the disease was 8.0 (5.0; 10.0) years on average. It should also be mentioned that the number of affected jSInts is 1.2 times higher in patients with chronic disease than in patients with recurrent disease, and the number of gout attacks was the TCme in both groups. The content of uric acid in blood plasma was higher in patients with recurrent disease than in patients with chronic disease (591±107.54 in the first group and 574±117.35 μmol/l in the second group, respectively, $p<0.05$). Hyperuricemia was observed in both groups.

Subcutaneous tophi were observed in 46 (43.8%) patients, their number was 6 (3; 10) on average. During X-ray examination, 76 (72.38%) patients had "Robotnik" symptoms of bony tophi.

Cardiovascular damage in gout

Cardiovascular diseases and additional diseases were studied in 56 patients with recurrent disease and 49 patients with chronic disease (Table 6).

During the examination, 32 (57.14%) of the group of patients with recurrent disease had high ABP, while 44 (89.79%) of patients with chronic disease had high ABP. In 67 (88.16%) of 76 patients with elevated ABP, the diAHnosis of arterial hypertension was established before referral to the hospital. There were 32 (42.1%)

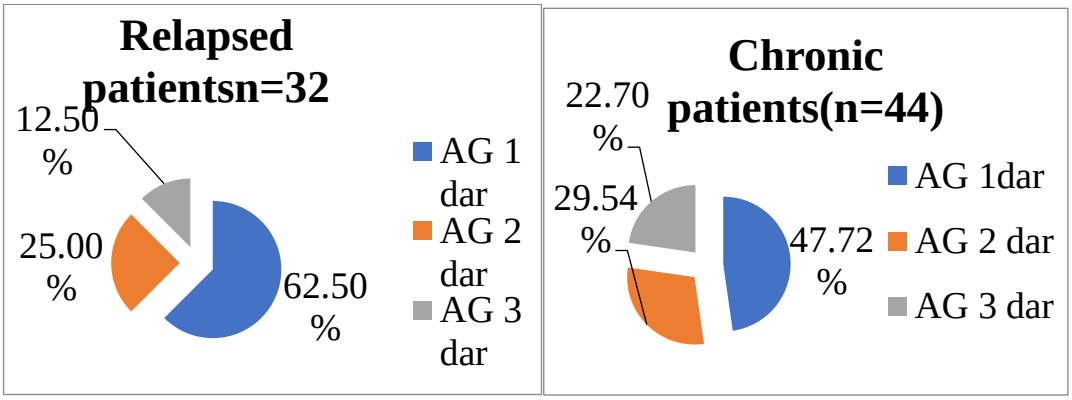
patients who used antihypertensive drugs for a long time (more than 3 months), only 21 (20%) of them had ABP in normal values.

6-Table

Additional diseases in patients with gout

Indicators	The course of the disease			
	Relapsed (n=56)		Chronic (n=49)	
	N	%	N	%
Arterial hypertension	32	57,14	44	89,79
IHD **In the anamnesis MI**	16 (4)	28,57 (7,14)	24 (6)	48,97 (12,24)
Diabetes 2 tip	8	14,28	13	26,5
Metabolic syndrome	25	44,64	31	63,26
SYUY	11	19,64	13	26,53
SBY	14	25,0	15	30,61

Among the patients of the first group, 20 (62.5%) had arterial hypertension I degree, 8 (25.0%) had II degree, and 4 (12.5%) had III degree of hypertension. Among the patients in the second group, 21 (47.72%) had arterial hypertension I degree, 13 (29.54%) had II degree, and 10 (22.7%) had III degree of hypertension (Fig. 2).



2. Frequency and levels of AH in gout.

It can be seen from the picture that the II-III level of arterial hypertension is more common in patients with chronic disease than in patients with relapsing disease.

We found it necesTCry to study the dependence of AH level depending on the duration of the disease (Table 7).

7-Table

The duration of the disease and the degree of dependence of arterial hypertension (%)

Disease duration (years)	**The degree of arterial hypertension**		
	I (n=41)	**II (n=21)**	**III (n=14)**
<2	6.14	1.54	1.546
2-5	9,31	6,151	3,07
6-10	23,24	9,21	6,2
>10	15,41	10,798	7,74

We divided 76 patients with arterial hypertension into the following subgroups: the first group included 41 patients with arterial blood pressure readings in the range of 140/90 - 160/90 mm Hg, and the second group included 21 patients with ABQ 140/100 -160/100 mm. sim. most patients, and in the third group 14 patients with ABQ values in the range of 160/100-180/100 mm.sim.ust. It can be concluded from table 3.2 that the longer the disease lasts, the number of patients with elevated arterial blood pressure increases accordingly. At this pSInt, it should be mentioned that the II-III degree of arterial blood pressure increase was the majority in patients whose disease duration exceeded 10 years.

Among patients with gout, the average Age of onset of AH was 50.65 (44.9; 57.25), and the duration of the disease was 3.9 (1.2; 8.7) years. The average Age of patients with arterial hypertension at the time of examination was 54.82 (48.5; 60.5), and this indicator was almost the TCme as that of patients without elevated blood pressure (54.3 (39.0;59.1) (p=0.01)). In most patients, we witnessed that AH

occurred after the onset of the disease (in 54 patients), on the contrary, in 22 patients, it was found that the increase of ABQ began before the disease. It should be noted that there is a correlation between the Age of the patients at the onset of the disease and the increase in arterial blood pressure (p=0.01). Table 3.3 below shows the relationship between the onset of the disease and the increase in ABQ among patients of different Ages.

8-Table

Correlation between the onset of the disease and the first detection of arterial blood pressure

Gout onset (Age)	n(%)	Age at diAHnosis of AH
<30	3(3,9)	29,32(23,92;34,63)
30-39	28(36,8)	35,46(28,2;45,62)
40-49	27(35,5)	43,12(36,45;50,81)
50-59	15(19.7)	52,78(45,41;63,67)
60-69	3(3,94)	62,45(52,92;65,71)

As can be seen from the table, arterial hypertension appeared in most patients (72.3%) between the Ages of 30 and 49.

IHD was recorded in 16 (28.57%) patients with recurrent disease, and in 20 (48.97%) patients with chronic disease. Only 5 patients were diahnosed with IHD at the hospital, which shows that patients have knowledge about the disease (88%). Myocardial infarction was detected in 5 patients with IHD disease in the anamnesis and ECG examination. In 30 (75%) patients stable angina pectoris I-II-III functional classes of IHD were noted.

It can be seen from Table 9 that the II-III functional classes of stable angina pectoris were more common in patients with chronic disease than in patients with recurrent disease.

9-Table

Frequency and description of IHD in patients with gout

IHD types	Gout episode

	Relapsed (n=56)		Chronic (n=49)	
	N	%	N	%
Exertion angina I FS	8	14,28	5	10.2
Exertion angina II FS	4	7.14	7	14,3
Exertion angina III FS	3	5,35	3	6,1
MI in the anamnesis	4	7,14	6	12,24

The average Age at the onset of IHD was 51.65 (48.8; 57.3) years, and the average IHD duration was 4.2 (2.1; 7.0) years. It was found that patients with IHD were 3 years older than patients without this disease (55.6 (51.1; 61.92) and 53.2 (48.1; 59.2), respectively ($p<0,01$)). In 10 patients, it was found that IHD occurred during the first gout attack, and in the remaining 30 patients, it was found that IHD occurred Against the background of gout.

The average Age of patients who had a myocardial infarction was 53.6 (43.6; 65.3) years. At the time of examination, the average Age of patients who had a myocardial infarction was found to be greater than that of those who did not: 56.45 (51.6; 61.9) and 50.5 (48.9; 60.2) years, respectively. ($p=0.01$). It was noted that myocardial infarction occurred in all patients after the onset of a gout attack.

Among the patients under examination, only 4 (3.8%) patients' anamnesis revealed changes characteristic of acute circulatory disorders in the brain. In all patients, it was found that the stroke occurred Against the background of gout. The average Age of patients at the time of stroke was 54.82 (52.2; 58.5). At the time of examination, the Age of patients who had a stroke was greater than that of patients who did not have a stroke: 60.44 (56.7; 62.8) and 54.5 (49.2; 60.3), respectively ($p=0.01$).Among the patients under examination, only 4 (3.8%) patients' anamnesis revealed changes characteristic of acute circulatory disorders in the brain. In all patients, it was found that the stroke occurred Against the background of gout. The average Age of patients at the time of stroke was 54.82 (52.2; 58.5). At the time of examination,

the Age of patients who had a stroke was greater than that of patients who did not have a stroke: 60.44 (56.7; 62.8) and 54.5 (49.2; 60.3), respectively (p=0.01).

10-Table

Frequency and description of SUI in patients with gout

SYUY types	According to the course of gout			
	Repeatedly (n=56)		Chronic (n=49)	
	N	%	N	%
SYUY I FS	7	12,52	7	14,33
SYUY II FS	4	7,141	6	12,24

Patients with chronic heart failure accounted for 24 (22,857%) of the patients in the study. The frequency of SUI was higher in patients with chronic disease than in patients with recurrent disease (13 (26.5%) versus 11 (19.64%)). In 14 of the patients functional class of SUI I was observed, in 10 patients functional class of SUI II was observed (Table 10).

Below, the third picture shows the dependence of SUI on Age and disease duration in patients with gout.

The mean Age of patients with chronic heart failure was significantly higher than that of patients without CVD symptoms (57.2±9.1 versus 54.3±8.9 years). The duration of the disease in patients with symptoms of SUI was 6.6 (4.1; 12) years on average, while the duration of gout disease among patients without heart failure was 4.0 (3.0; 12) years on average. 10) formed the year. The median Age of occurrence of chronic heart failure was 53.33 (47.4, 57.8) years, and its duration was 3.2 (1.3; 5.8) years. In 21 of the patients in the study, UTI occurred after the onset of the primary disease, and in only 2 cases UTI developed before the onset of gout.

Comparative analysis of jSInt syndrome and cardiovascular damage in gout.

We conducted a comparative analysis of patients with gout and jSInt syndrome with patients with AH, IHD, SUI and patients without these diseases. The

frequency of occurrence of diseases was as follows: AH 72.38% (n=76), IHD-38.09% (n=40), SYUY 22.8% (n=24).

10-Table

Correlation of gout disease severity index and its components with cardiovascular damage

Indicators	**AH**		**IHD**		**SYUY**	
	Bor (n=76)	**Yo‘q (n=29)**	**Bor (n=40)**	**Yo‘q (n=65)**	**Bor (n=24)**	**Yo‘q (n=81)**
Patient Age (years)	54,91 (48,6;60,5)	54,32 (39,0;59,1)*	55,61 (51,0;61,8)	51,62(48,0; 59,1)**	57,2(50,2; 63,5)	54,3(48,7; 60,2)**
Tofus %	49	56**	61	43	58	47
The number of tofus	3,0(2,0;5,0)	3,0(2,0;4,0)	3,0(2,0;7,0)	3,0(1,0; 6,0)	4,0(1,0; 8,0)	3,0(2,0; 6,0)
The number of jSInts affected during the disease	12,0 (5,0;18,0)	8,0 (4,0;14,0)	12,0 (8,0;14,0)	7,0 (5,0;10,0)	12,0 (5,0;15,0)	10,0 (4,0;13,0)
The number of jSInts affected during the examination	4,0(2,0;9,0)	4,0(3,0;8,0)	5,0(3,0;9,0)	5,0 (3,0;9,0)	5,0 (3,0;9,0)	4,0 (2,0;8,0)
Frequency of arthritis during the year, n	3,0 (1,0;6,0)	2,0 (1,0;6,0)	3,0 (2,0;5,0)	3,0 (1,0;4,0)	3,0 (2,0;7,0)	3,0 (1,0;6,0)
Duration of the last attack of the disease, per week	6,0(1,0;8,0)	5,0(2,0;13,0)	6,0 (2,0;9,0)	5,0 (1,0;9,0)*	6,0 (1,0;9,0)	6,0 (1,0;9,0)
Uric acid μmol/l	587 (433;624)	566 (421;623)	580,0 (490,0;623,0)	590,0(431, 0; 627,0)	570,0(428,0; 623,0)	590,0(430, 0;625,0)
Weight index score	3,31(2,71;3 ,8)	2,7(2,2;3,3)**	3,3(2,8;4,1)	2,9(2,4; 3,9)**	3,4(2,9; 4,3)	2,9(2,2; 3,9)**

Explanation: *- p<0.001; **- p<0.05

When we analyzed the jSInt syndrome in gout, a number of differences were found in patients with and without cardiovascular damage (Table 10). The number of jSInts affected during the disease and the severity index of the disease were found to be high in patients with AH, IHD, SUI (p=0.05).

The Age of patients with cardiovascular damage was older than patients without these pathologies (p<0.001). Gouty tophi were more common in patients with LUIK and SUI (53% and 50%, respectively, p<0.01). The number of

subcutaneous tophi and affected jSInts was almost the TCme in both groups (3 (2.0; 6.0) and 4 (3.0; 8.0) respectively (p< 0.01)).

11-Table

Correlation between a number of laboratory parameters and arterial hypertension in gout

Indicators	Arterial hypertension		
	Bor (n=76)	Yo‘q(n=29)	P
Uric acid μmol/l	587 (436;624)	564 (421; 613)	<0,01
SRO, mg/l	9,81±5,1	8,78±4,2	<0,05
XS, mol/l	6,832±1,10	6,439±1,41	<0,05
1000 mmol/l	1,591±0,47	1,921±0,73	<0,05
PZLPXS mmol/l	4,892±1,11	4,35±1,34	<0,05
TG, mmol/l	2,845±1,06	2,67±0,89	<0,001
Urea, mmol/l	5,678±1,7	5,82±1,38	<0,001
Creatinine, μmol/l	93,2±15,6	91,0±14,2	<0,001

In this table, laboratory indicators of gout patients with arterial hypertension (n=76) and without arterial hypertension (n=29) are presented.

It can be seen from table 11 that in gout patients with AH, blood plasma content of UA (p<0.05), total XS (p<0.05), PZLPXS (p<0.05), TGs (p< 0.001) showed higher values compared to patients without AH. The amount of 1000-folds showed low values in this group of patients (p<0.05). In gout patients with and without AH, urea and creatinine content in blood plasma showed almost no significant difference in both groups (p<0.001).

Table 12 below presents a comparative analysis of gout patients with and without IHD, clinical symptoms of gout.

12-Table

Clinical characteristics of patients with gout depending on the presence or absence of IHD

	IHD	

Indicators	**Bor (n=40)**	**Yo‘q (n=65)**	**P**
Disease duration, years	9,32(4;13,4)	6,21(2;7,5)	<0,001
Age at disease onset	46,81±8,7	46,52±9,6	<0,001
The number of jSInts affected during the disease	12(8;13)	7(5;9)	<0,05
Annual incidence of arthritis	3(1;6)	3(1;4)	<0,01

The onset of gout in patients with and without IUD was almost the TCme Age (46.81±8.7 and 46.52±9.6 years, respectively, p<0.001). It was found that gout onset was much earlier and the number of affected jSInts was higher in patients with IHD (p<0.001 and p<0.05, respectively). In both groups of patients, the number of gouty arthritis attacks in the last year was almost equal (p<0.01).

Characteristics of jSInt syndrome in patients with SUI

The severity of jSInt syndrome was studied in patients with and without chronic heart failure. Table 13 below shows the characteristics of jSInt syndrome in patients with or without SUI.

13-Table

Correlation characteristics of SUI and jSInt syndrome in patients with gout

Indicators	**SYUY**		**P**
	Bor (n=24)	**Yo‘q (n=81)**	
The number of jSInts damaged during the disease, n	14,0(7,0; 16)	11,0(6,0;5,0)	<0,001
The number of damaged jSInts during the examination, n	6,0(4,0; 8,0)	5,0(1,0; 8,0)	<0,01
Duration of the last attack of the disease, week	8,0(2,0; 10,0)	6,0(1,0;9,0)	<0,001
Arthritis throughout the year	4,0(2,0; 8,0)	4,0(1,0; 9,0)	<0,01

frequency, n	53	44	<0,01
Tofus,%	567(426;623)	593(432;630)	<0,01
Uric acid, μmol/l	3,41(2,9; 4,3)	2,92(2,3; 3,9)	<0,05

The data in this table show that patients with SUI have severe jSInt syndrome. The number of subcutaneous tophi and X-ray bony tophi in patients with SUI was higher than in patients without SUI. Hyperuricemia was observed in both groups of patients, but serum uric acid levels were found to be higher in patients without IHD than in those with this disease (594 (431; 630) versus 568 (427; 623) μmol/L, respectively ($p<0.05$)).

Metabolic syndrome and cardiovascular damage in gout

Metabolic syndrome was diahnosed in 56 (53.3%) of the patients under investigation. Metabolic syndrome was found in 44.64% of patients with recurrent gout, and 67.4% of patients with chronic disease.

The average Age of patients with metabolic syndrome was 55.75±9.2 years, and the average Age of patients without such syndrome was 53.25±8.4 years. The duration of the disease was 8.75±0.26 and 6.2±0.22 years, respectively. The frequency of metabolic signs was much higher among patients, these indicators are shown in table 3.10. However, it should be noted that two components of the disease severity index in both groups of patients: the number of affected jSInts (11(6; 16) versus 10(5; 16)) and the amount of uric acid in blood plasma 589, 0 (384.0; 630.0) on the contrary, 581.0 (436.0; 624.0) μmol/l showed almost the TCme indicators ($p<0.002$). more often: increase in ABQ (71.4%), increase in the amount of TGs (71.42%), hyperglycemia (57.14%) and decrease in the amount of YUZLPXS (52.1%). In this group of patients, visceral-type obesity was observed in 23 (41.7) patients. The following symptoms of metabolic syndrome were more common in patients with chronic gout: increased ABQ (73.5%), increased TG content (73.46%), visceral obesity (57.1%), and a decrease in the amount of YUZLPXS (88.1%). In

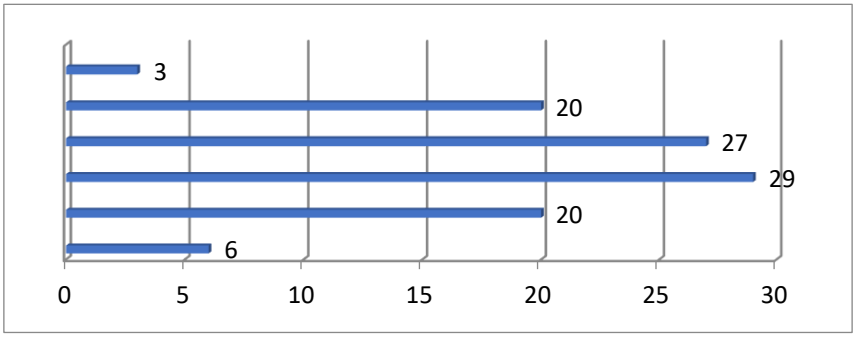
this group of patients, the increase in the amount of glucose in the blood is at the lowest rate. mentioned (51.0%).

14-Table

The incidence of symptoms of metabolic syndrome in patients with gout

Indicators	The course of the disease			
	Repeatedly (n=56)		Chronic (n=49)	
	N	%	N	%
BA >102 sm	23	41,08	28	57,1
TG≥1,697	40	71,42	36	73,46
YUZLPXS<1,65mmol/l	29	52,12	43	88,1
TCBP ≥135 mm.sim.ust va yoki DABP ≥89 mm.sim.ust	40	71,42	36	73,5
Glucose >6,2 mmol/l	32	57,14	5	1,0

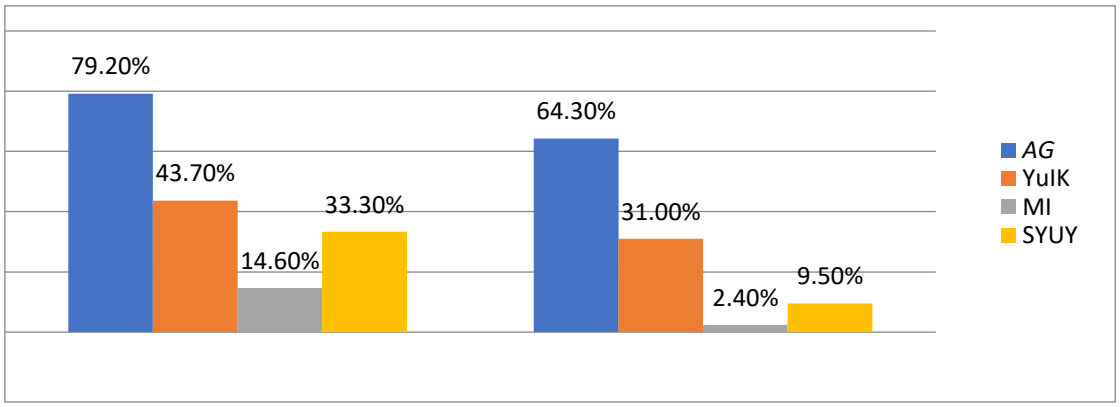
Almost all patients of both groups had some type of metabolic syndrome, only 3 (2.8%) patients did not have any of these 5 criteria. Patients with metabolic syndrome diahnostic criteria are shown in 4, most patients have 2-3 criteria.



4. Frequency of meeting the criteria of metabolic syndrome in patients with gout

Arterial hypertension was the most common criterion of metabolic syndrome among gout patients (72.38%). AH was detected for the first time in 8 (10.52%) patients. The mean TCBP was 150 (130; 175) mm.sim.ust in patients with MS, and 140 (120; 170) mm.sim.ust in patients without this syndrome (p <0.001), and diastolic blood pressure was found to be 95 (80; 120) and 90 (70; 115) mmHg, respectively (p<0.001). There were 32 (30.47%) patients who consumed

hypotensive drugs during the examination. It was found that patients with metabolic syndrome used more antihypertensive drugs than patients without this syndrome: 20 (35.7%) versus 12 (24.48%), respectively. In patients with metabolic syndrome, AH was observed in 79.2% of cases, while in patients without this syndrome, it was 64.3%. 43.7% of patients with IHD had metabolic syndrome and 7 (14.28%) of patients without metabolic syndrome (7 out of 8 patients with myocardial infarction had metabolic syndrome presence noted). Metabolic syndrome was noted in 19 out of 24 (33.93%) patients with chronic heart failure, while this syndrome was not detected in 5 (10.2%) patients.

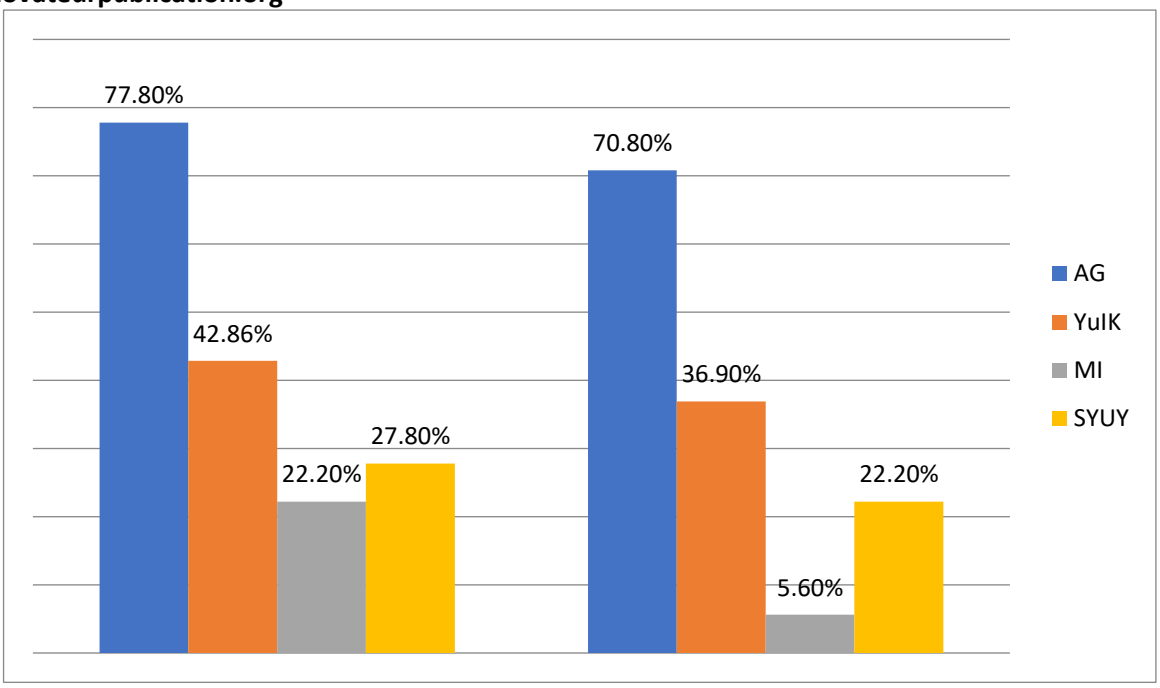


5. Frequency of cardiovascular disorders in gout patients with metabolic syndrome

It should be taken into account that in patients with metabolic syndrome, AH, MI (myocardial infarction), and SUI were observed more often ($p<0.05$) (Fig. 3.5).

Patients with diabetes were found in 21 (20%) of the patients in both groups, of which 8 (14.28%) had relapsed disease, and 13 (26.53%) had chronic gout. Among gout patients diahnosed with diabetes, AH was observed in 77.8% of cases, and in patients without diabetes, an increase in ABQ was detected in 70.8% of cases. YUCK was detected in 42.86% of gout patients diahnosed with diabetes. Of the 24 patients with SUI, 6 (28%) had QD and 18 (22.2%) did not have this disease.

Among gout patients with type II diabetes mellitus, patients with the acute coronary syndrome (myocardial infarction) and coronary artery disease were the majority ($p<0.05$) (Fig. 6).



6. Frequency of cardiovascular disorders in gout patients diahnosed with type 2 QD

Features of ABQ increase, its frequency and Age dependence of metabolic syndromeFeatures of ABQ increase, its frequency and Age dependence of metabolic syndrome

To study the relationship of AH level and other parameters of metabolic syndrome to patient Age, we divided patients into 3 groups: those younger than 50 years old (n=28), those from 50 to 60 years old (n=51) and the third group included patients over 60 years old (n=26). The frequency of occurrence of metabolic syndrome according to the Age of the patients was given.

It can be seen that the frequency of meeting AH increased proportionally to the Age of patients, and TCBP and DABP increased in a correct correlational manner with the Age of patients. Among the patients under 50 years of Age, hypertriglyceridemia (88.2%), decrease in YUZLPXS (79.1%) and increase in ABP (66.75%) types of metabolic syndrome were found. At this age, hyperglycemia was observed in a small percentage of patients (58.32%). 25% of patients had a waist circumference of more than 102 cm. Among the symptoms of metabolic syndrome in patients between 50 and 60 years of Age, TG (70.55%), AH (68.21%), decreased

amount of YUZLPXS (56.82%) and hyperglycemia (54.53%) were identified. In patients over 60 years of age, the decrease in the amount of AH, YUZLPXS and the increase in waist circumference was more than in other groups, while the increase in the amount of glucose in the blood plasma did not make a big difference compared to other groups of patients.

7. Age-related frequency of MS and AH in patients with gout

During the examination, the amount of triglycerides in the blood plasma showed an inverse correlation depending on Age.

The relationship between AH, metabolic syndrome and gout diseases in all three groups of patients was studied (Table 15).

15-Table.
Clinical characteristics of gout in patients of all three Age groups

Indicators	Age groups of patients		
	<50 yosh (n=28)	50-60 yosh (n=51)	>60 yosh (n=26)
Disease duration, years	4,68±1,86	6,13±3,21	13,92±8,5
Age at disease onset	39,4±5,4	48,3±6,4	52,7±11,6
Body mass, kg	88,9±17,6	92,4±16,4	87,6±8,9
BMI, kg/m2	28,8±4,7	29,8±4,67	29,2±2,5
BA, sm	100±9	107±11	115±11
UA, mkmol/l	593±95	597±124	539±98
XS mmol/l	6,68±0,88	7,15±1,19	6,26±1,32
PZLPXS, mmol/l	4,57±1,0	4,89±1,24	4,57±1,27
YUZLPXS, mmol/l	1,41±0,5	1,51±0,6	1,32±0,3
TG, mmol/l	3,42±0,8	2,92±1,1	2,11±0,9

The result of the analysis of the indicators shows that obesity and AH have a high importance in the early onset of gout, and these two factors, in turn, are closely related to each other and Aggravate each other. The course and severity of AH, components of metabolic syndrome increase proportionally with the Age of patients.

The progression of nephropathy in patients with gout and its relationship with cardiovascular damage

49 (46.7%) patients with symptoms of kidney damage were examined among patients with gout. In 21 (37.5%) of these patients, the main disease relapsed, and in 28 (57.1%) patients, it was found that the disease was chronic. Among the patients in the study, among the symptoms characteristic of kidney damage, urolithiasis, dysuric symptoms, back pain, macrohematuria and AH were found in most cases (Table 16).

16-Table

Clinical signs	The course of the disease			
	Repeatablen=56		Chronicn=49	
	N	%	N	%
Pain in the lower back	10	15,1	14	28,6
Dysuric symptoms	6	10,7	8	16,3
Urinary stone disease	7	12,5	9	18,36
Macrohematuria	1	1,78	3	6.1
Arterial hypertension	19	33,9	23	46,9

It can be seen from the above table that both groups of patients had low percentAges of macrohematuria and dysoric symptoms. Patients with urolithiasis were the majority, their number was determined in 16 (15.23%) patients in both groups. Back pain was the most common complaint in both groups of patients (15.1% in patients with recurrent disease and 28.6% in patients with chronic disease). Arterial hypertension was observed in most cases (40%) of gout patients with nephropathy (Fig. 8).

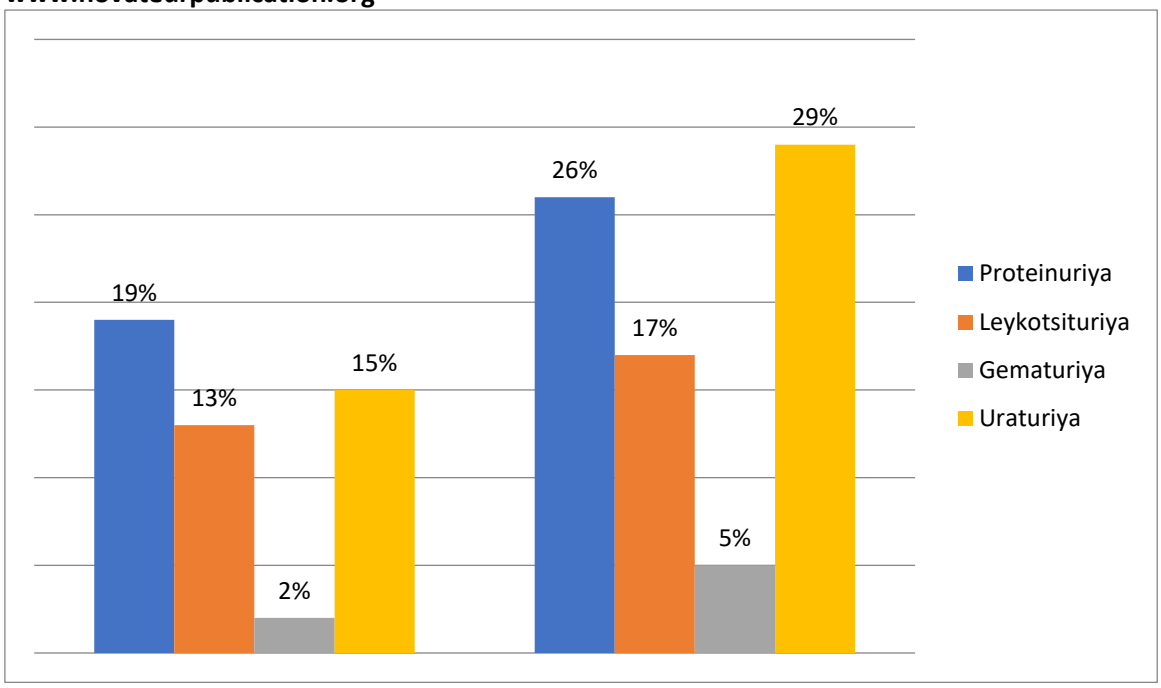
8. Renal damage in patients with gout clinical background the frequency of occurrence of gyri (n=105)

17-Table
General urinalysis in patients with gout (n=105)

Clinical signs	Number of patients	
	N	%
Proteinuria a) transient b) permanent	 17 6	 16,18 5,73
Leukocyturia a) not obvious b) obvious	 9 6	 8,57 5,7
Hematuria a) not obvious b) obvious	 11 4	 10,47 3,8
Uraturia	22	21,0

In the general urinalysis of 105 patients in the study, which was examined over a long period of time, proteinuria was detected in approximately ¼ of the patients. Proteinuria was noted to be of a non-obvious transient type in most patients (Table 17, 9).

In 23 out of 105 patients in the examination, it was noted that the amount of protein in the single-use urine was in the range of 0.0333-0.0991%o. The amount of protein in urine was 0.033-0.066% in most patients. Proteinuria of 0.1322 %o and 0.258 %o was noted in 2 patients only. When daily proteinuria was checked, its average value was found to be in the range of 0.172-0.451 g/l, only 3 patients had this value more than 0.451 g/l. In total, leukocyturia was detected in 15 patients, 9 of them had non-obvious leukocyturia, and 6 had obvious leukocyturia. Hematuria was detected in 13.3% of cases, of which 11 patients had it not clearly expressed, and 4 patients clearly expressed it (Fig. 9). urate Salts were detected in urine in 21.1% of patients.



9. General urinalysis indicators in gout (n=105)

The results of the UTT examination in identifying gouty nephropathy were high (Table 18). These indicators were also reflected in other investigations, and the level of accuracy was 93% (3). One or another type of damage was noted in 78.5% of cases during the UTT examination of the patients under investigation. Basically, urinary stone diseases were detected in the majority of patients (stones were noted in both kidneys in 1/3 of patients). Renal cysts were found in 9 patients, their diameter ranged from 0.5 to 3.2 cm, and their number was 1 to 3 cysts in one kidney. In 24 patients, changes in the renal calyx system together with stones were noted, when we added leukocyturia, additional pyelonephritis was diahnosed in 14 patients.

18-Table

Results of UTT examination in patients with gout (n=105)

Signs	**Number of patients**	
	N	**%**
ShrinkAge of the calyx segment **- concretion** **- decrease in kidney size** **- the presence of cysts**	 24 30 7 9	 23 28,6 6,7 8,6

Cardiovascular damage risk factors in gout In this part, the information of all examination methods presented in section 2 is presented in order to determine the cardiovascular risk factors in all 105 patients of all examinations.

The frequency of occurrence of cardiovascular risk factors in patients with gout in both groups (relapsing disease (n=56) and chronic disease (n=49)) is presented in Table 3.15.

It can be seen from Table 19 that the majority of patients (42.86%) were under 50 years of Age. Among the main cardiovascular risk factors, TCBP increase (72.383%), decrease in the number of CVDs (68.91%) and increase in the total number of XS (66.71%) were observed more than other risk factors. The number of smokers was less (12.22%). Among the additional risk factors, an increase in BMI (90.01%) and a high amount of TG were observed in most cases (51.1%). When examining the family history, 38.09% of the patients' close relatives were diahnosed with IHD, the number of relatives of patients with diabetes was 21 (20.0%).

19-Table

Cardiovascular risk factors in patients with gout

Risk factors	**The course of the disease**			
	Repeatedly n=56		**Chronic n=49**	
	n	**%**	**n**	**%**
Main XO				
Age >55	17	30,22	28	57,2
Smoking	4	7,13	9	18,37
TCBP≥140 mm.sim.ust	40	71,44	36	73,55
XS>6,5 mmol/l	42	75.2	28	57,2
YUZLPXS <1,6 mmol/l	29	51,74	43	87,8
Additional XO				
BMI ≥25 kg/m2	47	83,94	48	97,7
TG> 2,3 mmol/l	27	48,4	27	54,8
Diabetes 2 tip	5	8,9	16	33,3
In the anamnesis IHD	16	28,57	24	48,97

The average height of the examined patients was 1.745±0.069 m (from 1.57 to 1.98 m), and the average weight was 90.22±15.12 kg (from 64 to 131 kg). Only 10

(9.521%) of the patients in the study were found to have a normal body weight. 57 (54.281%) patients were overweight, 35 (33.33%) were obese, 3 (2.82%) were severely obese.

The following indicators were used to determine the type of obesity of patients in both groups: BA-103.891±12.19 cm, TC-102.721±9.19 cm, their ratio BA/TC-1.03±0.062. Visceral type obesity was noted in 81.8% of patients, and 12 (20.7%) patients were found to have excess body mass.

An increase in the amount of PZLPXS (>4.9 mmol/l) was observed in 49 (46.7%) patients, hyperuricemia was noted in 93 (88.57%) patients.An increase in the amount of PZLPXS (>4.9 mmol/l) was observed in 49 (46.7%) patients, hyperuricemia was noted in 93 (88.57%) patients.

10. Frequency of meeting the main risk factors in gout

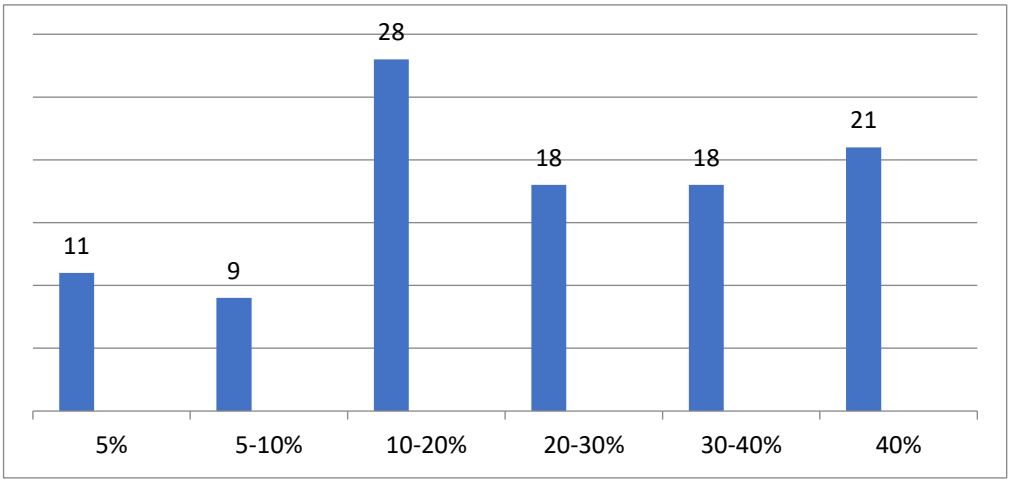
Among the patients, all 5 main risk factors of cardiovascular damage were detected in 3 (2.86%) patients, 4 XO in 16 (15.23%) patients, 3 XO in 36 (34.28%) patients, 31 2 (29.52%) patients, 14 (13.34%) patients had 1 main risk factor. Only 6 (5.71%) patients did not have a major risk factor (P. 10). Of the additional risk factors, 41 (39.047%) patients had 2, 23 (21.9%) had 3 risk factors.

It should be noted that the frequency of cardiovascular risk factors in gout is very high.

Determination of cumulative coronary risk in gout

The smallest percentAge of coronary risk (less than 5%) was observed in only 11 (10.47%) patients. Moderate (5-20%) coronary risk was found in 37 (35.2%) patients. Despite the fact that the majority of patients (57%) were patients under the Age of 55, 54.4% of patients had a high (more than 20%) coronary risk. In 18 (17.14%) patients with high coronary risk, the percentAge of coronary risk was in the range of 20-30%, in another 18 (17.14%) patients, the coronary risk was

determined around 30-40%. and in the remaining 21 (20.0%) patients, we found that this risk exceeded 40%. (Fig. 3.12).



11. Indicators of coronary risk in patients with gout

As expected, a significant correlation was observed between the main risk factors and coronary risk (p=0.25, p<0.01). For example, in patients with one major risk factor, the coronary risk is 11% (2-29%), when two major risk factors are identified, the coronary risk is 22% (2-50%), in patients with three or more major risk factors, the coronary risk is 31 % (10-50%). We noted that the coronary risk was 5% (2-16%) in patients without one of the main risk factors.

In order to determine the coronary risk, we divided the patients into 2 groups: the first group included patients with a coronary risk of less than 20% and the second group included patients with a high coronary risk (more than 20%). Patients with IHD and or type 2 QD were included in the second group, that is, patients with a high coronary risk.

Table 20 shows the frequency of occurrence of main and additional risk factors among both groups of patients.

It can be seen from table 20 that the patients of the second group were adults in terms of Age, and TCBP and BMI in this group showed much higher indicators.

20-Table

Main and additional risk factors depending on the degree of coronary risk

Risk factors	**KX<20% (n=48)**	**KX≥20% (n=57)**	**P**

Main			
Age year	50,45±7,48	58,32±8,78	<0.001
Smoking, n(%)	1 (2.08%)	12 (21.05%)	Nd
TCBP, mm.sim.ust	142,3±14,5	158,2±15,6	<0.001
XS, mmol/l	6,9 (4,8; 8,7)	6,6 (3,7; 9,0)	Nd
YUZLPXS, mmol/l	1,42 (0,7; 2,7)	1,3 (0,7; 2,5)	Nd
Additional XO			
BMI, kg/m2	29.1±4.33	29.9±4.3	Nd
TG, mmol/l	2.892(1.25; 4.43)	2,71(1,31; 6,0)	Nd
QD 2 tip, n(%)	8(16,6%)	13 (22,8%)	Nd
IHD family anamnesis, n(%)	16(33,33%)	24 (42,1%)	Nd

In patients with a small coronary risk (<20%), the amount of uric acid (SC) was 574.62±110.25, while in the group of patients with a high coronary risk, this indicator was 574.92 ±115, It was 85 μmol/l.

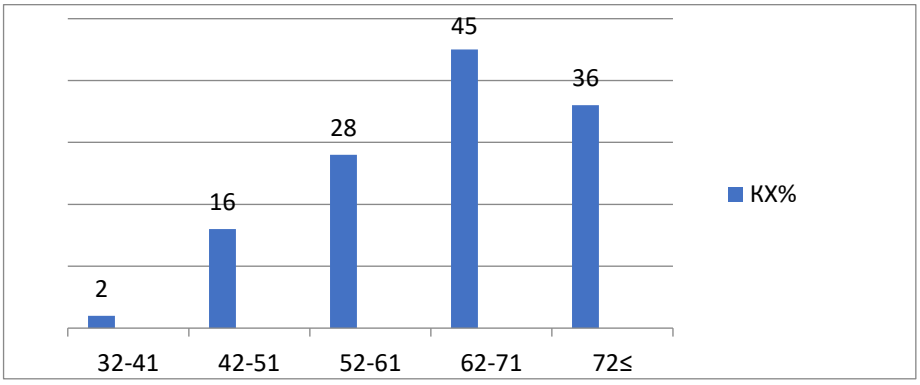
Taking into account the high importance of the Age of patients in the development of coronary risk, different Age groups of patients were analyzed separately (Table 20, s 10-11). Patients were divided into the following Age groups: Group I 32-41 years old (n=5), Group II 42-51 years old (n=36), Group III 52-61 years old (n=43), Group IV 62-71 years old (n= 14) and patients older than 72 years (n=7) to group V.

Table 21

Clinical and biochemical changes in patients of different groups

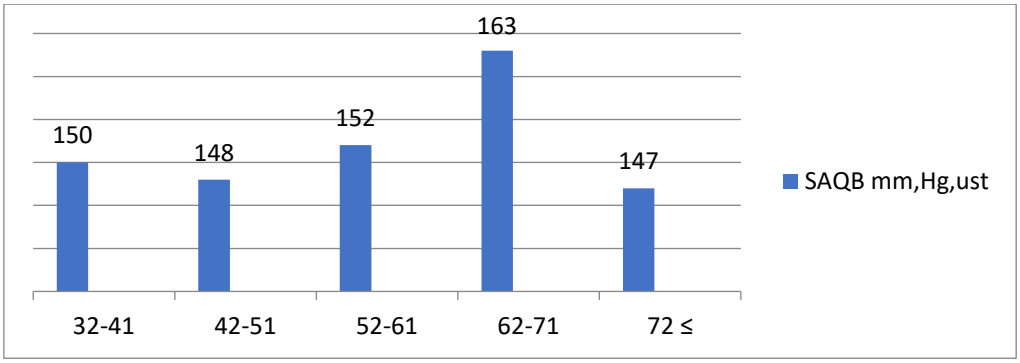
Indicators	**I (n=5)**	**II (n=36)**	**III (n=43)**	**IV (n=14)**	**V (n=7)**
BMI, kg/m2	25,82±2,16	26,72±1,96	27,6±2,9	27,8±2	30,7±1,4
TCBP mm.sim.ust	150,5±21,6	148,5±21,5	152,2±222	163,3±16,0	147,2±22,4
XS, mmol/l	7,31 [6.9; 7,65]	7,0 [6.8; 7,5]	7,54 [7; 8]	6.74 [5.9; 7,8]	7,18 [7; 7,43]

YUZLPXS, mmol/l	2,13 [1.95;2.3]	1,99 [1.88; 2,2]	1,99 [1.86; 2,2]	1,88[1.76; 2,0]	1,98[1.94 ;2,02]
Glucose mmol/l	6,2[5.8; 7,44]	5,7[4.9; 7]	6,9[6.3;7,6]	6,8[5.8; 8]	7[6.21; 8]
TG, mmol/l	3,63[2.91; 4,4]	3,1[3; 3,4]	3.4[3; 3,4]	3,2[3; 3,4]	3,21 [2.6;5]
UA, mkmol/l	627±73	596±53	607±70	549±82	621±55



Age of patients (years)

12. Correlation indicators between patients' Age and KX



Age of patients (years)

13. Relationship between TCBP and Age of patients in gout.

It was found that the coronary risk in patients increases every decade, high levels of this indicator were evident from 5-10 years ($p<0.01$) (Fig. 13). As the Age of the patients increased, TCBP increased in parallel ($p<0.01$) (Fig. 13). Cholesterol levels were high in all Age groups. It was not possible to study the relationship between the Age of patients and the amount of XS, YUZLPXS, UA (in all cases $p>0.05$). It was observed that the amount of TGs in the blood decreases as the Age

ratio increases in patients with gout. These data show that cardiovascular diseases in gout are more likely to occur not only in older patients, but also in younger patients.

When comparing the results of coronary risk in patients and the clinical symptoms of gout disease, we witnessed interesting data (Table 22).

It can be seen from Table 22 that patients with high KX were clearly distinHYished by indicators of the main severity level of gout disease. In this case, a correct correlation was found between KX and the duration of the disease, the number of affected jSInts (p=0.33, p<0.001, p=0.40, p<0.05, respectively).

22-Table

Clinical characteristics of gout disease according to KX level

Indicators	**KX<20% (n=48)**	**KX≥20% (n=57)**	**P**
Disease duration, years	4,61 [1,1; 6,2]	10,21[4.2;15,4]	<0,001
Age at disease onset	45,67±8.2	47,71±10,2	<0,001
The number of jSInts damaged during the disease, n	6,62 [4,1; 8,0]	6,0 [4,0; 9,0]	<0,05
The number of affected jSInts in the last year of the disease, n	2, 3[2,0; 4,0]	3,1 [3,0; 6,0]	<0,05

Determination of cardiovascular risk factors in patients with gout with LUIK

In order to determine the main risk factors of IUD in gout, we divided the patients into two separate groups: Group 1 - 65 patients without IUD, Group 2 - 40 patients with IUD (Table 23).

It can be seen from Table 23 that the number of older patients and TCBP indicators were much higher in patients with IHD than in those without this disease. QD disease was also observed in the group of patients with high KX. The duration

of AH in patients with IHD was long when the patient's anamnesis data were collected. The duration of AH in the first group of patients was 8.3 years on average, while in the second group of patients this indicator was 10.35 years on average (p<0.05).

23-Table

Cardiovascular risk factors in patients with gout with and without IUD

Risk factors	**IHD mavjud bo‘lmAHan (n=65)**	**IHD mavjud bo‘lgan (n=40)**	**P**
main			
Age year	35,62±9,21	56,54±8,62	<0,001
XS, mmol/l	6,81 [4,8; 8,0]	6,83 [4,7; 8,2]	Nd
YUZLPXS, mmol/l	1,27 [0,9; 2,2]	1,42 [0,9; 2,1]	Nd
Chekish, n(%)	5 (7,7%)	11 (27,5%)	Nd
TCBP, mm.sim.ust	154,6±14,91	159,3±15,5	<0.001
Qo‘shimcha XO			
TG, mmol/l	3,13 [1,45; 4,33]	2,712 [1,33; 4,20]	Nd
BMI, kg/m2	29,44±4,1	29,83±4,5	Nd
IHD bo‘yicha SIlaviy anamnez, n(%)	19 (29,23)	15(38,2)	Nd
QD 2 tip, n(%)	13 (20%)	8(20,0%)	Nd

In patients of both compared groups, the content of uric acid in blood plasma was almost equal (588.5 ± 118.15 and 573.5 ± 102.55 μmol/l, respectively (p=0.6)). Metabolic syndrome was more common in patients with IUD than in gout patients without this disease (61.7% and 50%, respectively).

Structural and functional state of myocardium in patients with gout

44 patients with gout (all male) were selected for examination in this section. Depending on the course of the disease, patients were divided into recurrent and chronic types. All patients underwent Echocardiography (ExoKG).

The average Age of the patients was 56.62±8.52 years (from 42 to 73 years). 7.92% of patients under 44 years old, 50.01% from 45 to 59 years old, 42.12% from 60 to 73 years old.

The average Age of patients at the onset of the disease was 43.5±8.35. In most patients (73.72%) the disease started between 35-53 years of Age. The youngest patient with the disease was 29 years old, and the oldest patient with the onset of the disease was 61 years old.

The average duration of the disease was 10.0 (6.0; 16.52) years, that is, from 2 months to 39 years.

All patients were divided into 2 groups: group 1 - 15 patients with relapsing disease, second group - 29 patients with chronic disease. The average Age of patients in the second group was higher than that of patients in the first group (57.44±8.7 and 56.8±8.12 years, respectively, $p<0.05$). Chronic gout patients had a longer history of gout than relapsing patients (13.0 [7.0; 17.0] and 12.0 [3.0; 24.0] years, respectively, $p<0.05$). . In patients of the second group, BMI was higher than in the patients of the first group (31.92 [28.91; 34.68] and 31.76 [25.01; 42.52] kg/m2, respectively, $p<0.05$). Regardless of the course of the disease, the level of uric acid was determined in both groups of patients. The amount of uric acid in blood plasma was 599.8 (356.7; 870.0) μmol/l in patients with recurrent gout, and 536.8 [473.4; 473.4; 602.1) μmol/l. In comparison, there was a difference between the two groups of patients ($p<0.01$).

When studying the cardiohemodynamics of patients during the course of gout, a number of changes were revealed.

In patients with chronic gout, it was found that the size of the left ventricle at the end of diastole (TSLVD) and the volume at the end of diastole (LVDOH) increased by 4.65 and 10.3%, respectively, compared to the patients with recurrent gout. The size of the left ventricle at the end of the systole (LVSOO') and the volume of the left ventricle at the end of the systole (LVSOH) were found to be increased by 2.45 and 5.45%, respectively, in patients with chronic gout ($p<0.05$).

The thickness of the interventricular barrier in the investigated groups showed almost the TCme indicators (Table 4.1) ($p<0.05$). The thickness of the back wall of the left ventricle showed 1.65% higher results in patients with chronic disease than

in patients of the first group. Taking this into account, it can be Said that a number of indicators were found to be high in patients with chronic disease (Table 4.2). When calculating the relative thickness of the left ventricular wall, the difference between the first and second group of patients was 106.85%, as shown above.

It was observed that the left ventricular myocardial mass increased in parallel with the severity of gout disease in only one direction. Among the examined groups, this indicator caused a significant difference ($p<0.05$). LVMM was 103.75% ($p<0.05$) in patients with chronic gout than in patients with recurrent disease. In the examined groups, LVMMI was almost equal in both groups (Table 24) ($p<0.05$).

Transmetral blood flow indicators were studied in all patients using the ExoKG test. The following parameters of transmetral flow were determined in each patient:

- normal type: E/A=1.0-2.0; LVIRT=50-100 ms; LVSTD>170 ms.
- hypertrophic type: E/A<1.0; LVIRT>100 ms; LVSTD<170 ms.
- pseudonormal type: E/A=1.0-2.0; LVIRT<50 ms; LVSTD>170 ms.
- decompenTCted type: E/A>2.0; LV IBV<50ms; LVSTD<170 ms.

24-Table

Cardiohemodynamic indicators in patients with gout

Indicators	**The course of the disease**	
	Repeatedly (n=15)	**Chronic (n=29)**
TSLVD, sm	5,36 [4,82; 6,21]	5,45 [5,10; 5,75]
LVDOH, ml	128,2[107,52; 193,99]	141,35 [124,81; 160,04]
LVSOO‘, sm	3,38 [3,01; 3,70]	3,46 [3,11; 3,65]
LVSOH, ml	46,67 [35,07; 58,13]	49,55 [37,94; 56,35]
QATQ, sm	1,24 [0,9; 1,47]	1,22* [1,18; 1,28]
LVODQ, sm	1,23 [1,15; 1,48]	1,25* [1,16; 1,33]
RTLVW	0,49 [0,40; 0,57]	0,46* [0,42; 0,467]
LVMM, g	258,75 [187,22; 442,15]	268,41* [225,36; 335,76]
LVMMI, g/m2	132,8 [94,17; 220,57]	132,45 [109,95; 165,29]

Explanation: *-p<0.05 The difference between 1 and 2 groups of patients. Among the patients in our studies, only 2 types of transmetral flow disorders were identified: normal and hypertrophied types. Transmetral flow indicators of patients are presented in table 25.

25-Table

Indicators of transmetral flow in patients with gout

Indicators	Normal type of transmetral flow (n=30)	Hypertrophic transmetrial flow (n=14)
E, m/s	112,96 [106,0; 118,0]	85,77 [80,0; 96,0]*
A, m/s	86,25 [71,0; 100,1]	100,17 [100,1; 101,06]*
E/A	1,374 [1,14; 1,544]	0,867 [0,79; 0,96]*
LVIRT, ms	61,54 [55,2; 79,5]	123,54 [99,5; 147,3]*
LVSTD, ms	172,34 [152,5; 190,3]	138,55 [99,5; 150,22]

Explanation: *- p<0.001 the difference unit of patients of the first and second groups.

When studying left ventricular diastolic dysfunction (LVD) among patients with gout, disorders were noted in 26.6% of patients with recurrent disease and 37.9% of patients with chronic disease (Table 26).

26-Table

Frequency of LVDD in patients with gout, n (%)

Indicators	Gout season		P
	Repeatedly (n=15)	Chronic (n=29)	
LVDD yes	4 (26,6)	11 (37,9)	<0.01
LVDD no	11 (73,3)	18 (62,07)	<0.01

As can be seen from the results, structural changes of the left ventricle are clearly visible in patients with gout depending on the course of the disease. LVDD

is observed in 34.09% of patients with primary gout, the rate of which develops depending on the course of the main disease.

Correlation between central hemodynamics and changes in the structure of the left ventricle in patients with gout.

In this research, we divided the patients into groups based on the geometric structure of the left ventricle. Depending on LVMM (left ventricular myocardial mass) and LVNDQ (relative left ventricular wall thickness), 4 groups of geometric models of the left ventricle are distinHYished [8].

- LV with normal geometry (NGLV) – normal LVMMI and normal LV have NDQ;
- concentrically remodeled LV (KRLV) - LVNDQ is increased, LVMMI is normal;
- concentric hypertrophied LV (KGLV) - increased LVNDQ, increased LVMMI;
- eccentrically hypertrophied LV (EGLV) - LVMMI increased, LVNDQ decreased.

Patients with all four types of left ventricular architecture were found among the patients under investigation: 10 (22.72%) patients with NGLV, 8 (18.2%) patients with KRLV; KGLV was detected in 15 (34.09%) patients and EGLV in 11 (25%) patients (14).

It was found that every 4th patient with gout does not have left ventricular architecture disturbance, 1/3 of patients have LVEF, 25% of patients have LVEF, and the remaining patients have normal LVEF.

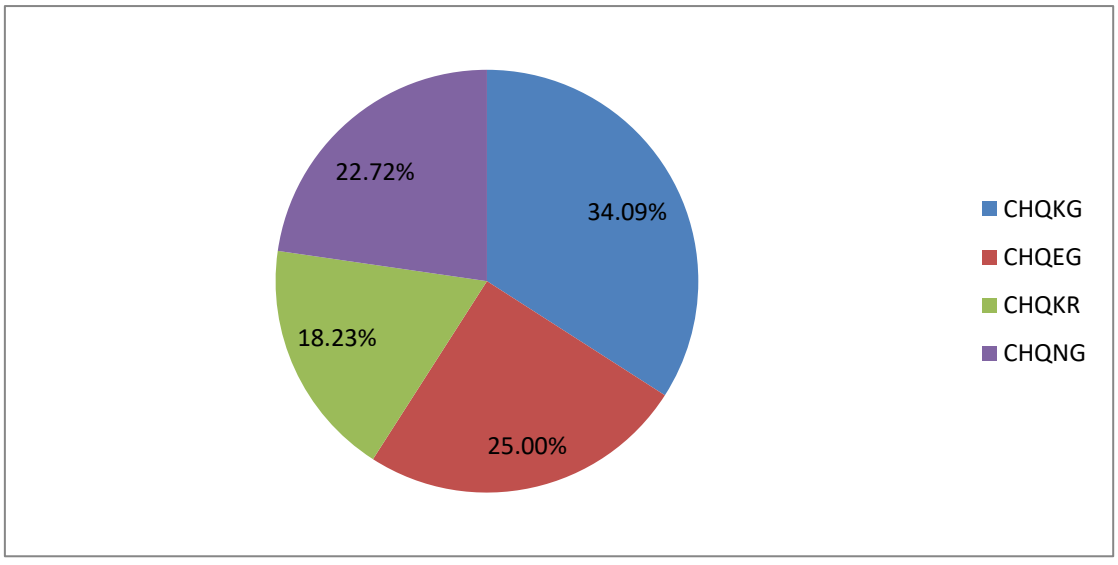


Fig. 14 Distribution of patients according to the architecture of the left ventricle

Changes in the geometric structure of the left ventricle were also observed in patients depending on the severity of gout disease (Table 27).

27-Table

The frequency of occurrence of LV geometric forms in gout disease depending on the course of the disease

Geometric types of left ventricle	The course of the disease		P
	Repeatedly (n=15)	Chronic (n=29)	
NLVG	2(13,45)	8 (27,58)	<0.05-
CRLV	4 (26,6)	4(15,38)	<0.05
CHLV	6 (40)	9 (31,03)	<0.05
LVEG	3 (20)	8 (27,6)	<0.05

CHLV was observed in 31% of patients with chronic gout, LVEG was developed in 27.6% of patients, CRLV was developed in 15.4% of patients, and NLVG was observed in 27.58% of patients. The most (40%) of patients with recurrent disease developed CKD, and 26.6% of cases developed CKD. In relapsed patients, LVEG was observed in 20% and NLVG in 13.4%. In our study, the overall incidence of left ventricular failure was 61.5% in patients with recurrent disease and 56% in patients with chronic disease. In most cases, concentric hypertrophy of the left ventricle was found in patients. It is known that these architectural disorders are among the non-modifiable risk factors of the cardiovascular system and are among the worst risk factors for the development of heart failure [34,37].

28-Table

The frequency of occurrence of LVDD in gout, depending on the geometric forms of LV

Indicators		NLVG (n=10)	CRLV (n=8)	CHLV (n=15)	LVEG (n=11)
LVDD	Yes	3 (30,0)	6 (75)	3 (20,0)	3 (27.27)
	No	7 (70)	2 (25%)	12 (80,0)	8 (72.72)

P	<0.001	<0.01	<0.001	<0.001

In the literature, there was no information about the study of diastolic filling of the left ventricle depending on the geometric structure of the left ventricle in gout, so we decided to conduct this analysis. The obtained results show that the diastolic function of the left ventricle is disturbed in most cases in CHLV (Table 4.5).

It was found that 36% of patients with gout with AH had CHLV, 29.0% of patients had LVEG. It was noted that ABP was also within normal parameters in patients with NLVG. Interestingly, in 54.5% of patients it was observed that the architecture of the left ventricle was disturbed even in the normal state of ABP (Table 29).

29-Table

Frequency of occurrence of LV geometric types in patients with AH with gout

Indicators		**NLVG**	**CRLV**	**CHLV**	**LVEG**
AH	**Yes (n=30)**	4 (12.9)	6 (19.35)	11 (35.48)	9 (29.03)
	no(n=14)	6(46.15)	2 (15.38)	4 (30.77)	2 (15,38)
P		<0.01	<0.05	<0.01	<0.05

\

Changes in the structural and functional state of the myocardium in patients with gout due to AH

44 patients with primary gout underwent echocardiography. 14 patients with normal ABP were included in the first group and 30 patients with AH were included in the second group. The average Age of patients in the first group was found to be younger than that of patients in the second group (53.82 [51.22; 60.7] and 59.64 [49.84; 63.0], respectively, p<0.05). It was found that the content of uric acid in blood plasma was almost equally high in patients with and without AH (563.6 [339.0; 916.0] and 568.7 [361.0; 883.5] μmol/l, respectively respectively, p<0.05).

DOO' and DOH of LV were found to be increased by 4.65 and 11.3% in the second group of patients compared to the first group of patients (Table 4.7) (p<0.05).

It was found that SOO' and SOH of LV increased by 2.4 and 6.6%, respectively, in the second group of patients (p<0.05).

It was found that QATQ was 4.3% thicker in the second group of patients than in the first group. Differences between the investigated groups were clearly visible. It was observed that the thickness of the back wall of the left ventricle increased by 8.7% in patients with AH compared to the first group (p<0.05). The indicators were clearly demonstrated in height examinations in patients with AH. The relative thickness of the walls of the left ventricle was 102.35% in group 2 patients (p<0.05).

30-Table

Cardiohemodynamic indicators depending on the presence or absence of AH in gout

Indicators	Arterial hypertension	
	No (n=14)	Yes (n=30)
LV DOO‘, sm	5,29 [4.71; 5,65]	5,53 [4.95; 6,25]
LVEDV, ml	127,92* [102.37; 146,42]	142,53 [111.8; 193,99]
LV SOO‘, sm	3,47 [3.00; 3,70]	3,49* [3.01; 3,90]
LVESV, ml	45,55 [35.00; 54,42]	48,51* [35.01; 64,91]
QATQ, sm	1,15* [0.93; 1,28]	1,21* [0.90; 1,41]
LVODQ, sm	1,26 [1.05; 1,46]	1,39* [1.14; 1,59]
RTLVW	0,46 [0.35; 0,54]	0,47* [0.40; 0,52]
LVMM, g	237,57* [161.31; 311,85]	282,21 [182.4; 418,50]
LVMMI, g/m2	117,50 [83.60; 153,9]	142,47* [90.63; 217,33]

Explanation: *-p<0.05 clear differences between the first and second groups**.**

In patients with AH, LVMM is 1.2 times higher than in patients without this disease. LVMMI also showed high indicators in the second group of patients in line with LVMM (Table 30).

When we studied the rise of ABP depending on the progression of gout, we TCw that this indicator is higher in patients with chronic disease (Table 31).

31-Table

Depending on the course of the gout disease, the frequency of AH is n (%)

Indicators		Patients with recurrent gout (n=15)	Patients with chronic gout (n=29)	P
AH	Yes	9 (60)	21 (72,4)	Nd
	No	6 (40)	8 (27,58)	Nd

We analyzed diastolic dysfunction of the left ventricle depending on the presence or absence of AH in patients (Table 32). It was found that diastolic dysfunction of LV is observed in 28.57% of cases even in patients with gout who have normal QB. More than 33% of patients with gout have diastolic dysfunction of LV.

32-Table

Frequency of LVDD meeting depending on the presence or absence of AH,n(%)

Indicators		Arterial hypertension		P
		Yo‘q (n=14)	Bor (n=30)	
LVDD	Yes	4 (28,57%)	10 (33.3%)	<0.01
	NO	10 (71.42%)	20 (66.7)	<0.01

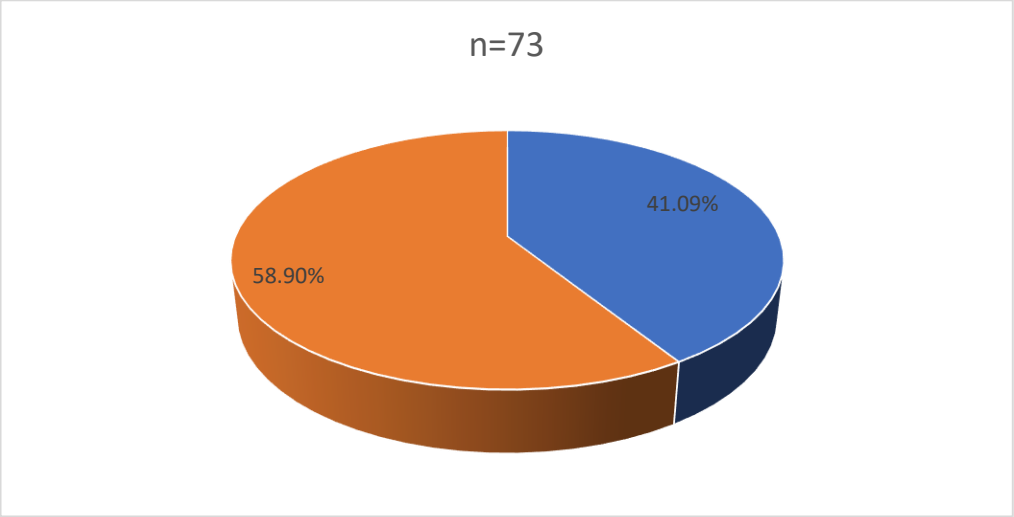
Based on the above results, it can be Said that patients with gout have different changes in left ventricular architecture and diastolic dysfunction, which develops depending on the course of the disease, the geometric structure of the left ventricle, and arterial hypertension..

Allopurinol and febuxostat treatment of gout disease and elimination of risk factors

The main goal of the treatment of gout is to eliminate hyperuricemia, in which achieving a decrease in the amount of UA to 458 μmol/l or less reduces the number

and duration of relapses and has an effective effect on reducing the number of tophi. In our studies, patients were prescribed febuxostat for treatment or for normalization of CK levels after the initial examination.

73 patients were re-examined after 6 months to evaluate the effectiveness of treatment when gout disease was accompanied by metabolic syndrome. The effectiveness of the treatment was evaluated by the number of relapses during the year, duration, amount of SC and main indicators of MS. All patients were divided into 2 groups: patients in group 1 included patients who received the drug febuxostat. Group 2 included allopurinol-treated patients. Distribution of patients by groups is shown in 15.



15. Distribution of patients.

Among the patients in our study, 30 (41.09%) were prescribed febuxostat and 43 (58.9%) patients received allopurinol.

The dynamics of clinical and laboratory indicators of gout after 6 months of treatment with febuxostat and allopurinol are presented in table 33. In both groups, the frequency and duration of relapses, as well as the amount of SC and C-reactive protein ($p< 0.001$) were reliably recorded.

33- Table

Clinical and laboratory indicators of gout after 6 months.

Indicators	« Patients receiving febuxostat » (n=30)	« Patients receiving allopurinol » (n=43)

	6 months AHo	6 after a month	6 months AHo	6 after a month
6 the number of relapses during the	3,62 [2,1 - 4,5]	1,01 [0,0 - 2,5]	4,1 [2,0 - 6,0]	2,51**[1,0-4,02]
Duration of most recent relapse (hafta)	6,1 [3,0-7,5]	2,5 [0,02 - 4,0]	7,0 [4,0-14,2]	4,5**[3,01-8,5]
The number of tofus	2,2 [0,0 - 2,0]	2,0 [0,01 - 2,0]	2,0 [0,09 - 2,0]	2,0 [0,09 - 2,0]
UA, mkmol/l	493,77± 82,36	331,64±38,27	553,72±84,99	441,8±59,52***
S- reactive protein, mg/l	2,812[1,69-3,58]	1,27[0,87-2,12]	3,871[1,21-15,14]	2,13*[1,08-4,4]
Fibrinogen, g/l	4,45 ± 0,943	2,54 ± 0,92	4,31 ±1,57	2,75 ± 1,3

Reminder: « A clear difference was observed when compared with the group of patients receiving febuxostat * - $p < 0,05$, ** - $p < 0,01$, *** - $p < 0,001$.

The total number of tofus did not change in 2 groups of patients. When patients were compared, the number and duration of relapses, the number of total tophi and C-reactive protein were not significantly different, only the concentration of SC in the serum was higher when comparing the group "Patients receiving Allopurinol" to the other group. On average, 30 patients received febuxostat at a daily dose of 100 mg. 43 patients received allopurinol in a daily dose of 200 mg. In the group "Patients receiving febuxostat", the amount of SC decreased to the target values, the number and duration of relapses were significantly reduced in 6 months compared to patients receiving allopurinol ($p < 0.01$). These indicators were also observed in the duration of the last relapses ($p < 0.01$). C-reactive protein was significantly decreased in patients with a serum SC concentration of less than 360 μmol/l. Taking into account this fact, the final indicators of gout remission were comparable in both groups, without taking into account the amount of UA, the main clinical differences between the compared groups were observed.

34 –Table

Rates of patient adherence to achieve risk factor adjustment between comparison groups

Factors increasing hyperuricemia	« Febuksostat qabul qilgan bemorlar » (n=30)		« Allopurinol qabul qilgan bemorlar » (n=43)	
	Under review	6 after a month	Under review	6 after a month
Obesity (%)	19 (63.3%)	15 (50%)	35 (81,39%)	31(72.09%)
Smoking (%)	7 (23.3%)	6 (20%)	16 (37,2%)	17 (39,5%)
Alcoholic beverAges (%)	21 (70%)	11 (36.7%)	32 (74,4%)	14(32,56%)
Diet (%)	9 (30%)	27 (90%)	9 (20.93%)	37 (86,04%)

In addition to the use of febuxostat for treatment, it was recommended to study its effect in the correction of the main risk factors. Table 5.2 shows the level of patients' adherence to recommendations for correction of modified risk factors due to overt hyperuricemia and the corresponding target values of SC. There was no clear difference between the groups, but in the allopurinol group, body mass reduction was observed in a small percentAge, and all patients in this group continued to smoke.

35-Table

Dynamics of the main parameters of the metabolic syndrome during treatment with febuxostat and allopurinol

Indicators	« Patients receiving febuxostat » (n=30)		« Patients receiving allopurinol » (n=43)	
	Present time	6 after a month	Present time	6 after a month
BMI, kg/m2	29,88 [20,78 -35,4]	28,55**[20,33-32,7]	29,344 [20,8 -34,65]	29,44*** [20,24- 31,4]
BA, sm	94,1 [92,0- 101,0]	95,2***[92,5 -101,0]	95,88[93,2-101,3]	95,24*** [93,5- 99,3]
TCBP mm.Hg.ust	154,0 [148,0-160,0]	131,0*** [130,0- 137,54]	144,0[141,0-53,5]	136,1*** [128, - 141,0]

Glycemia, mmol/l	5,592 ± 0,678	5,143 ±0,613***	5,968 ± 0,945	5,641 ±0,82**
PZLPXS mmol/l	3,762 [3,37 - 4,75]	3,126*** [3,0-3,4]	3,861 [3,381 - 4,75]	3,28*** [3,13-3,87]
YuZLP XS mmol/l	1,073[0,973-1,18]	1,146* [1,012 - 1,232]	1,018 [0,89-1,252]	1,14[1,0-1,23]
TG, mmol/l	2,762 [1,8-3,575]	2,179*** [1,73-2,541]	2,39[1,531-3,18]	1,99** [1,78-2,435]

Reminder: A clear difference was observed when comparing with the initial data * - p< 0,05, ** - p < 0,01, *** - p < 0,001.

Table 35 shows the dynamics of clinical and laboratory indicators of metabolic syndrome depending on the effectiveness of treatment with febuxostat.

In both compared groups, BMI, waist circumference, TCBP, PZLP XS, TG concentration, and glycemia were significantly reduced. An increase in the concentration of UZLPXS was observed only in patients receiving febuxostat.

Statistically, the reliability coefficient showed a decrease in TG in the group "Patients receiving Febuxostat" ($p < 0.001$) and a tendency to decrease in BMI was observed. ($p < 0.05$).

It should be noted that there was no significant difference in MS parameters between the compared patients after 6 months of febuxostat treatment, except for glycemia. A higher level of glycemia was observed in patients receiving allopurinol ($p < 0.05$). No obvious effect of febuxostat dose correction on MS parameters was observed, but a strong correlation was observed between the decrease in ABP level and the amount of febuxostat ($p = 0.21$).

Importance of drug and non-drug treatment methods in the elimination of cardiovascular risk factors in patients with gout.

In order to eliminate metabolic disorders in patients with gout, it was recommended to quit smoking, diet, and reduce body mass.

Medical correction of ABP and disorders of lipid and carbohydrate metabolism was carried out. The dynamics of the main anthropometric indicators, the level of TCBP, changes in serum glucose and lipid concentration after the treatments are shown in Table 5.4.

When we re-examined the patients after 6 months, there was a significant decrease in body mass (p<0.001), BMI decreased by an average of 0.72 kg/m2 in each patient, and the average waist circumference did not change. Abdominal obesity showed little difference compared to BMI.

The recommended treatment had an effect on a clear decrease in the amount of TCBP, PZLPXS, TG (p<0.001), where the average value of triglycerides -0.631 mmol/l was maximally reduced.

The increase in the average amount of UZLPXS was 0.042mmol/l (p<0.05).

35-Table

Dynamics of the main risk factors during the control period in the treatment of patients with gout

Indicators	6 months AHo	6 after a month
Tana masTCsi, kg	101,25 [90,21-110,67]	97,62 [84,0- 106,0]***
BMI, kg/m2	31,63 [28,0-32,0]	31,28 [28,7-33,8]***
Waist circumference, sm	97,0 [93,0-102,0]	95,0 [93,0-103,0]
TCBP mm.Hg.ust	146,0 [142,0-159,5]	133,0 [131,0-138,0]***
Umumiy XS mmol/l	5,97 ± 1,24	5,067 ±0,71***
PZLPXS mmol/l	3,79 [3,37-4,71]	3,24 [3,1-3,83]***
YuZLPXS mmol/l	1,045 [0,933-1,291]	1,141[1,013-1,231]*
TG, mmol/l	2,36 [1,672-3,57]	1,882 [1,77-2,3]***
Glycemia, mmol/l	5,93 [5,12-6,12]	5,341 [4,93-6,1]***

Note: Clear differences were observed when compared to the original data * - p < 0,05, *** - p < 0,001.

According to the obtained results, the reduction of risk factors in cardiovascular diseases in patients during the controlled period of the study was

evaluated according to the SCORE scale. The significance of the assessment on this scale is shown in Table 36.

It was observed that the risk factors of cardiovascular diseases were significantly changed in these assessment criteria ($p < 0.001$). According to the SCORE criteria, it was observed that the risk decreased from high to medium and low in patients receiving febuxostat, and from moderate to low in patients receiving allopurinol.

36-Table

Dynamics of assessment of risk factors according to the SCORE scale during the control period in patients with gout

YuQT disease risk assessment	6 months AHo	After 6 months
Patients receiving febuxostat (n=30)	6,73 [4,03-8,84]	2,18 [0,96 - 3,74]***
Allopurinol-treated patients (n=43)	13,35 [5,76-22,9]	5,67 [3,74 - 10,19]***

Note: A clear difference was observed when compared to the initial data *** - p< 0,001.

Taking into account this fact, a reliable reduction of all factors was found in re-examinations after 6 months of treatment, a correlational analysis was conducted taking into account the risk assessment on the selected scale, this analysis clearly shows the reduction of risk factors in cardiovascular diseases. done for The results of the analysis are shown in table 5.6.

The dynamics of changes in the main risk factors were studied using the SCORE scale. Graphs of this relationship are shown in s 16 and 17.

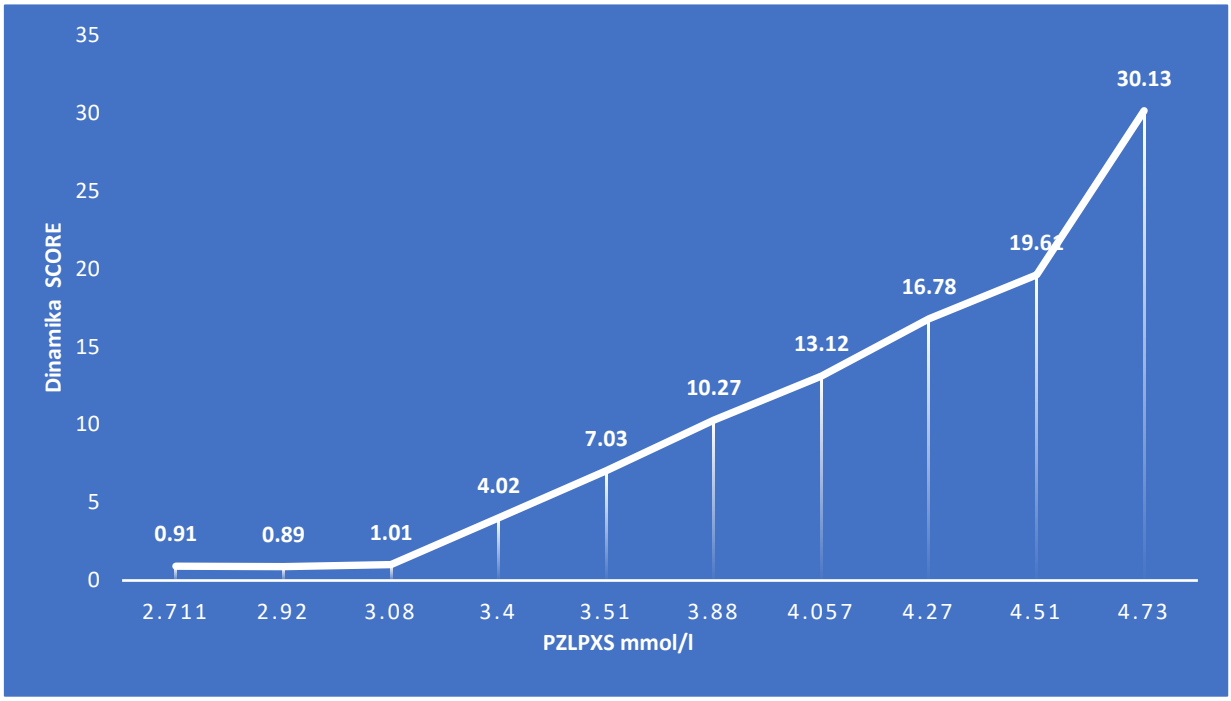
37 – Table

SCORE assessment of the correlation of the main risk factors according to the scale

Indicators	Correlation coefficient R

	SCORE (patients taking febuxostat)	SCORE (Patients taking allopurinol)
TCBP mm.Hg.ust	0,062	0,091
General XS, mmol/l	0,043	0,23
YuZLPXS, mmol/l	-0,155	- 0,35*
PZLPXS, mmol/l	0,048	0,42**
TG, mmol/l	0,043	0,24

Note: Dependency detected *- p< 0,05 ** - p< 0,01

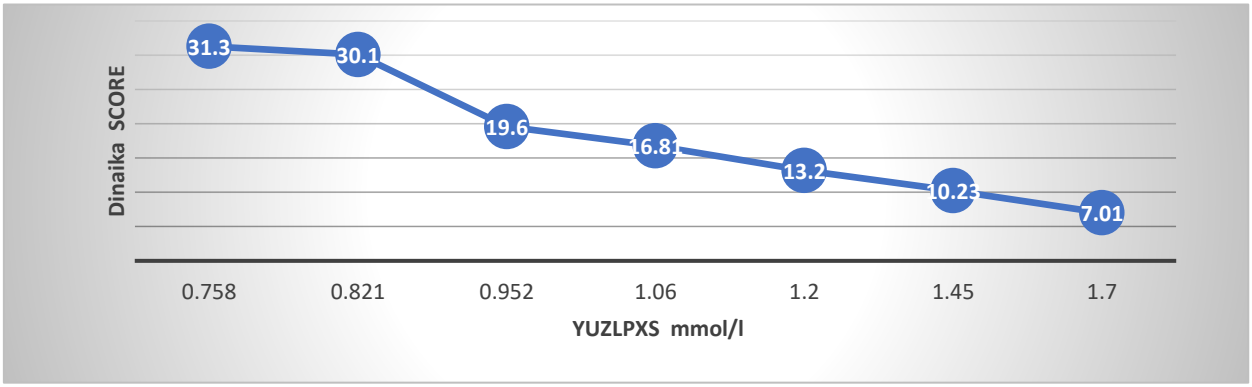


16 – picture. To study the correlation between the risk factors of STDs according to the SCORE scale and the level of PZLPXS.

Note: Correlation coefficient R=0,43, p < 0,01.

A clear correlation was found according to the SCORE scale. The main contribution to the reduction of the cumulative risk factor on the scale presented in the control period was made by non-smokers Aged 51.07±10.43 in the group of patients

receiving febuxostat.



17: Study of the correlation between the risk factors of STDs according to the SCORE scale and the level of STD.

Note: The correlation coefficient is R = - 0,35, p < 0,05.

In addition, during the control period, a correlation analysis of risk factors was conducted according to SCORE according to the amount of SC and S-reactive protein, and a decrease in the amount of these indicators was observed. The obtained results are shown in Table 38. The interesting thing about these data is that the analysis showed a reliable direct relationship between the risk factor on the SCORE scale and the decrease in the amount of SC in the serum, graphically shown in 16. 'shown.

38-Table

Evaluation of the correlation of UA and S-reactive protein level during the control period according to the SCORE scale

Indicators	Correlation coefficient R	
	SCORE (patients taking febuxostat)	SCORE (Patients taking allopurinol)
UA, mkmol/l	0,08	-0,012
The amount of decrease in UA, mkmol/l	0,07	0,36*

C-reactive protein mg/l	0,05	0,12
Decreased amount of C-reactive protein mg/l	-0,11	0,011

Note: A trusted relationship has been detected * - p< 0,05

This relationship was clearly manifested in patients who received febuxostat during the control period, with a decrease in the amount of PZLPXS and an increase in the amount of YuZLPXS.

It can be assumed that treatment with febuxostat resulted in a decrease in serum UA, a decrease in PZLPXS, and an increase in YuZLPXS. As a result, the cumulative risk factor for cardiovascular diseases decreased according to the SCORE scale (p<0.001).

The prevalence of gout in the population is 5-28 in 1000 men, and 1-6 in 1000 women, the disease mainly begins after the Age of 40, and its prevalence is between the Ages of 40-50 in men and after the Age of 60 in women. will be high (Galushko E. A. Mediko-sotsialnaya znachimost rheummaticheUAikh zabolevaniy : avtoref. dis. ... d-a med. nauk / E. A. Galushko. — M., 2011. — 47 p.; Yakunina I.A. Indeks tyajesti podAHry. Actress.diss. K.m.n. Moscow 2006; Sidorova A.S. Clinical characteristics, factor risk podAHry u mans g. IrkutUAa. Avtref. Diss. K.m.n. IrkutUA. 2009;)

In recent years, changes in the diet and nutritional characteristics of the population, the increase in metabolic syndrome among the population, and the increase in the number of people taking diuretics and aspirin in small doses have led to an increase in the prevalence of gout (BarUAova V.G. and dr., 2011; Mikhnevich E. A. Gout: lifestyle, medication. Zdravooxranenie. 2012. No. 3. S. 51–56; ChSI H.K., 2007; Kim S.Y. 2010).

Currently, the medical and socio-economic importance of gout disease is due to the widespread nature of the disease, its chronic course, deep damage to internal organs, negative impact on the quality of life and health of patients, and the high cost of treatment and rehabilitation procedures. explained (Eliseev M.S., MukAHova M.V., Glukhova S.I. Svyaz klinicheUAikh proyavleniy i komorbidnyx zabolevaniy s pokasetlyami kachestva jizni u bolnyx podAHroy. Nauchno-prakticheUAaya rheumatologiya. 2015; 53(1): str. 45–50 ; Urazaeva L.I.. The role of some inflammatory, hemodynamic and clinical factors in tubulSInterstitial tissue damage in patients with gout. Autoref. Diss. k.m.n., Kazan. 2017;).

Gout is a disease with many causes. In its development, hereditary (genetic), Age and gender factors, dietary disorders, weight gain, injuries, nervousness, physical stress, infections, weather changes, and taking diuretics or other types of drugs are important. becomes important (BarUAova, V.G. Chronic gout: causes of development, clinical manifestations, treatment. Ter. archive. 2010. No. 1. S. 64–68. Shangina A.M. Kliniko-patogeneticheUAoe znachenie narusheniya sosudisto-thrombotsitarnogo hemostaza i pokazateley microcirculation in patients with primary gout. Autoref. Diss. K.m.n. Chita 2012; BarUAova V.G. DiAHnostika podAHricheUAogo arthrita. RMJ. Rheumatology. Regim dostupa: http://www.rmj.ru. Data dostupa: 15.09.2013;).

Changes in the cardiovascular system are the most common cause of death in patients with gout (BarUAova V.G. i dr., 2006; Denisov I.S., Eliseev M.S., BarUAova V G. IUAhody podAHry. Obzor literature. chapterII. Comorbidnye zabolevaniya, risk razvitiya serdechno-sosudistyx katastrofi i smerti pri podAHre.

Nauchno-prakticheUAaya rheumatologiya. 2013. No. 1. 703-716; GAHliardi A., 2009; Chang F.K. et al. ., 2010).

Hillis G.S. et al., (2009). Lee S.J. et al., (2009) revealed a relationship between increased uric acid (UC) levels and the development of arterial hypertension, obesity, lipid metabolism disorders, platelet activity changes, and atherosclerosis. A 1 mg/dL increase in CK has been shown to increase overall mortality from ischemic heart disease by 12% (Kim S.Y. et al. 2010). Puzanova O.G., (2009), Lebedeva M.V., (2010), TCvSIu G. (2008) observed endotheliocythemia endotheliocythemia, blocking of NO-synthetase, increase in the amount of endothelin-1, and early disorders of endothelial function in gout.

Even though much attention has been paid to the study of gout disease in recent years, in modern studies, one of the most serious complications of the disease - the clinical, laboratory, and instrumental signs of cardiovascular damage, these damage with the severity of the main disease and other concomitant diseases little attention is paid to the jSInt transition (MAHdeeva N.A. Kliniko-diAHnosticheUAoe znachenie endothelialnoy disfunksiiijestkosti arterii u bolnih gotAHroy v sochetanii s arterialnoy hipertenei. Avtoref. Diss. k.m.n., TCratov. 2009; Brijataya YU.O. Kliniko-pathogeneticheUAoe znachenie i koreksiya adsorbsionno-rheologicheUAih parametrov krovi u hipertensivnix bolnix podAHroy. Autoref. Diss. k.m.n., DonetUA. 2017;).

In our investigations, patients with AH were observed in 76 (72.38%) of a total of 105 patients with gout. This means that AH has a higher percentAge compared to other checks. In our study, patients were divided into 2 large groups according to the course of gout: group I of patients with recurrent disease (n=56) and group II of patients with chronic disease (n=49). The frequency and characteristic symptoms of cardiovascular 32 (57.14%) of the mentioned patients were diahnosed with AH during the examination. 44 (89.8%) of patients with chronic disease were diahnosed with AH during the examination. It was noted that in 68 (89.47%) of all patients, the diAHnosis of AH was established before the patients applied. Among the patients,

32 (47.05%) patients who used antihypertensive drugs for a long time (more than 3 months), it was found that only 15 (22%) of these patients had normal blood pressure.

20 (62.5%) of the patients in the first group had I grade AH, 8 (25.0%) II grade AH, and 4 (12.5%) III grade AH. Of the patients in the second group, 21 (47.72%) had I degree AH, 13 (29.8%) II degree AH and 10 (22.7%) III degree AH. In this investigation, in patients with a chronic disease, II-III degree AH was found in more percentAges.

R.D. In the investigations conducted by Abbott and his colleagues, it was determined that the risk factors for the development of IHD in patients with gout are 60% higher. H.K. In the investigations conducted by ChSI and his colleagues, it was determined that patients with a history of gout and no pathology in the coronary arteries have a 28% risk of death, and the risk of death from cardiovascular diseases is equal to 38%. Patients in this study were found to have a 55% higher risk of death from MI [147].

In our study, 16 (28.57%) patients with relapsed disease and 24 (48.97%) patients with chronic disease were diahnosed with IHD. YUCK was detected in only 5 of the patients who were examined at the hospital, and the remaining 88% of patients were informed about the disease. 5 (12.5%) of the patients with IHD had a history of myocardial infarction. 30 (75%) patients were diahnosed with IHD stable tension angina functional class I-III.

In 10 (25%) patients, IHD was noted during the primary gout attack, and in the remaining 30 patients, it was found that IHD developed Against the background of gout.

In our study, 24 (22.9%) patients with SUI were present, and more patients with chronic gout had SUI (13 (26.5%) versus 11 (19.64%)) in line). I-FS was detected in 14 (58.3%) patients with SUI, and II-FS heart failure was noted in 10 (41.7%) patients. The average Age of the development of SUI disease is 53.1 [47.2;

57.8], and the duration of the disease was 3.1 [1.3; 5.7] formed the year. In most patients (21), it was found that SUI was caused by gout.

According to the literature, the frequency of metabolic syndrome in gout patients is on average 35-55%. In our study, the incidence of metabolic syndrome in patients with gout was 53.3% (56 patients). Metabolic syndrome was observed in 44.64% of patients with recurrent gout, and 63.26% of patients with chronic disease.

The study of the frequency of meeting individual components of the metabolic syndrome in gout presented the following results: the most frequently identified components in patients were an increase in ABQ, a decrease in the amount of UZLPXS, and hyperglycemia. Visceral obesity was detected in 51 (48.6%) patients (BA>102 cm).

Almost all patients in the study had one or another type of metabolic syndrome, only 3 (2.85%) patients did not have any of the 5 signs of metabolic syndrome. In most patients, 2 or 3 components of metabolic syndrome were added.

AH was noted as the most common component of metabolic syndrome in 76 (72.4%), of which 8 (7.62%) patients were diahnosed with AH for the first time. In patients with metabolic syndrome, AH, IHD and SUI were more than in patients without this syndrome ($p<0.05$).

In gout patients younger than 50 years, the following components of MS were observed: a decrease in the amount of VLDLs by 79%, hypertriglyceridemia by 67%, increase in ABQ by 66.7%. In these patients, an increase in the amount of glucose in the blood was found in a small percentAge (58.3%), and visceral obesity was noted in 25% of patients (BA>102 cm). Among patients with gout in the Age range of 50-60 years, AH was -68.2%, reduction in the amount of LUZLPXS -56.8%, and hyperglycemia -54.5%. In addition, a slight decrease in the number of triglycerides in the blood was noted in this Age group (45.5%). In patients over 60 years of Age, the components of the metabolic syndrome, such as a decrease in the amount of AH, YUZLPXS, and visceral obesity damage of patients in both groups were studied.

Illness is qorganized more. It was found that the amount of hypertriglyceridemia decreased even more at this Age.

In our studies, the Age groups of patients and the increase in the number of triglycerides in the blood plasma showed an inverse correlation.

Type 2 QD occurred in 21 (20%) of the patients in the study. Type 2 QD was recorded in 8 (14.3%) patients with recurrent gout and 13 (26.53%) patients with chronic gout. It was found that hyperglycemia and hyperinsulinemia in patients with gout, combined with HY, have a bad effect on urate metabolism. AH, IHD, and SYUY were found to be more frequent in patients with gout accompanied by diabetes ($p<0.05$).

In patients with gout, kidney damage is observed in 30-50% of cases, according to some data, this indicator reaches up to 75% (and the mortality rate develops from this complication in 10-25%) [104].

In our examinations, kidney damage was noted in 49 (46.7%) patients, among them 21 (37.5%) patients had relapsed gout, and 28 (57.1%) patients had a chronic disease. The most common symptoms of kidney damage in patients were: kidney colic, dysuric symptoms, pain in the lower back, macrohematuria, and AH.

Proteinuria in our tests (22.3%), K. Kineva, and O.V. Sinyachenko came close to proteinuria in the tests.

Cardiovascular damage showed a certain correlation in patients with gouty nephropathy. Among patients with gouty nephropathy, AH was detected in 42 (85.7%) patients, IHD in 18 (36.73%) patients, and SUIY in 14 (28.6%) patients.

Taking into account the lack of information on the frequency and distribution of cardiovascular risk factors in patients with gout, we focused the next part of the conclusions of our scientific work on these results.

More than 90% of patients develop cardiovascular diseases under the influence of at least 1 cardiovascular risk factor among humans [162,172,173]. We know that increased cardiovascular risk factors also increase the risk of CHD [173].

In this case, the sum of several underdeveloped risk factors is more dangerous than 1 main risk factor [106,173].

It has been found that almost 70% of patients with gout have two or more cardiovascular disease risk factors [106]. Among them, risk factors such as dyslipidemia, AH, QD, and obesity are the most important [45, 43, 61].

In the investigations carried out by researchers, the main factors of the development of YUKT diseases in gout are the male gender and older people [160,100]. One of the main risk factors is the increase in TCBP [145, 88, 97].

Another important risk factor for the development of cardiovascular diseases is smoking [82]. In patients who smoked at least 20 cigarettes per day, the risk of developing MI increased 6 times in women and 3 times in men [169]. 36% of patients with primary MI were found to be smokers [155].

The average height of the patients in the study was 1.75±0.07 (from 1.56 m to 1.99 m), and the average weight of the patients was 90.2±15.1 (from 65 to 130 kg). up to) kg. Only 11 (10.5%) patients had a normal body mass, 58 (55.6%) were overweight, and 36 (34.28%) were obese. Visceral type obesity was observed in 81.8% of obese patients, and 12 (20.7%) of overweight patients had this type of obesity. An increase in the amount of PZLPXS (>4.9 mmol/l) was detected in 49 (46.7%) patients, while the increase in the amount of UA during the examination was found to be high in 93 (88.57%) patients.

In conclusion, patients with gout have a high frequency of risk factors for cardiovascular damage. All five main risk factors were observed in 4 (3.8%) patients, 4 in 16 (15.23%) patients, 3 in 36 (34.28%) patients, 30 (28.57%) patients 2 and 14 (13.34%) patients had 1 main risk factor. In addition, 41 (39%) patients had 2, and 23 (21.9%) patients had 3 additional risk factors.

Only 11 (10.47%) patients had a low coronary risk (less than 5%), while 37 (35.6%) patients had an average coronary risk (5-20%). Even though the majority of patients (57%) were under the Age of 55, 54.4% of patients were included in the group of patients with high coronary risk (⩾20%). 20-30% of them have a coronary

risk 18 (17.14%) patients, 18 (17.14%) patients with 30-40% coronary risk, and 21 (20.0%) patients with more than 40% coronary risk. As expected, a correlation between the main risk factors and coronary risk was noted ($p=0.25$, $p<0.01$). For example, if 1 major XO is present, XK is 11% (2-29%), if 2 AXOs are present, XK is 22% (2-50%), if 3 AXOs are detected, XK was found to be 31% (10-50%). Patients without any major risk factors had a coronary risk of 5% (2-16%). It was observed that the coronary risk increased as the Age of the patients increased, the highest coronary risk was observed in 5-10 years ($p<0.01$). Hypercholesterolemia is observed in high frequency in all Age groups. As the Age of the patients increased, it was observed that the number of triglycerides in them decreased. These results show that not only older patients with gout but also younger patients have a higher risk of cardiovascular diseases. A correspondingly higher percentAge of coronary risk was noted in patients with high severity of gout disease. Correlation between coronary risk, duration of gout disease, and several affected jSInts was found in patients (($p=0.33$, $p<0.01$) and ($p=0.40$, $p<0.001$) respectively).

Studies have shown a direct relationship between myocardial damage and purine metabolism disorders [82, 9]. It is considered that the development of cardiopathy in gout is caused by the formation of uric acid or urate Salts, which is relatively common in the population of patients with this disease [126, 7].

In patients with primary gout, data on diastolic dysfunction and cardiac remodeling processes are scarce and sometimes conflicting. In a series of studies, the relationship between the amount of SC in the blood and damage to target organs in patients with AH was studied.

The results obtained are also not the TCme. Several studies have analyzed the relationship of HY with LVMM and other markers of organ damage [74, 98, 138, 29, 99]. Other authors could not determine the relationship between LVMM of UA, carotid lesions, or microalbuminuria [3, 1, 96,82,89].

P.X. In the study of Djanashiya et al., they found that uricemia was reliably correlated with the E/A ratio and that the relationship was inverse, that is, the

increase in the amount of UA was accompanied by the deterioration of the diastolic function of LV. have shown. In this investigation, the degree of dependence of uricemia on TCB, DABP, LVMM, LVMMI, XS, and YUZLPXS indicators was not fully clarified. It was found that the deterioration of LV diastolic function was not related to the degree of LV hypertrophy.

O.V.Sinyachenko and his co-author researches investigated the nature of damage to the heart in patients with gout.

As a result of ECG and ExoKG examinations, changes in the cardiovascular system were detected in 82% of patients. At the TCme time, LV hypertrophy was detected in 43% of patients, and AH was noted in 62% of these patients. At the TCme time, in ExoKG, the following types of valvular apparatus damage were detected in 70% of patients on average: thickening of the LV - in 50% of cases, thickening of the back wall of LV - in 44%, hypertrophy of CHB - in 36%, LVDD - in 31.5% of cases. Also, various disturbances in heart rhythm and conduction, with the predominance of ventricular extrasystole are noted. At the TCme time, it was found that the above-mentioned changes often occur in the chronic form of the disease. By the way, in this study, it was found that the development of cardiopathy is directly related to the concentration of SC and xanthine oxidase in the blood.

In our study, 44 patients (all men) were selected for examination to study the structural and functional state of the myocardium in patients with gout. Depending on the course of gout (recurrent and chronic), patients were examined for ExoKG.

Remarkable results were noted when we studied the central hemodynamic indicators of patients according to the clinical course of the disease.

LV DOO' and DOH in chronic gout patients compared to LV SOO' and SOH - 4.65 and 10.3% and 2.4 and 5.45%, respectively ($p< 0.05$) were found to be increased. 106.8% thickening of LVNDQ, QATQ, and LVODQ was noted when comparing groups 1 and 2. The significance of LVMMI in the studied groups was almost the TCme in both groups ($p<0.05$).

It was found that in every fourth patient has LV there are no disturbances in its architecture, in almost one-third of patients, CHLV is formed, in 26.7% of cases, LVEG, and in one-fifth of patients, changes in its cavity (CRLV) are observed, while the normal index of myocardial mass of LV is preserved.

The frequency of formation of different geometric models of LV changes depending on the severity of the disease. Thus, in the group of patients with chronic gout, CHLV was recorded in 32% of cases, LVEG in 24% of cases, and CRLV in 16% of cases, it was found that normal geometric parameters of LV were preserved in 28% of patients. In the group of patients with relapsed gout, CHLV was observed in most cases (46.1%), unlike the above group, it was found that CRLV (23.1%) was formed in the second place in terms of frequency. In the group of patients with recurrent disease, LVEG and normal geometry of LV occur with the TCme frequency (15.4%). In our study, the overall frequency of LV hypertrophy development was 61.5% in patients with recurrent disease and 56% in patients with chronic disease. At the TCme time, according to the type of modulation of the left ventricle, the most frequent CHLV was found. It is known that this type of LV architectural disorder is an unmodified factor of cardiovascular risk and is considered the most dangerous factor in the development of heart failure [42, 37].

Almost 37% of patients with CHLV and 30% of patients with LVEG were found to have AH, and in patients with NLVG, normal values of ABQ were recorded in more cases. It should be noted that in 54.5% of patients without AH, various disturbances of LV architecture were detected. It was found that 27.3% of patients with gout and normal ABQ developed diastolic dysfunction of the left ventricle. More than 33% of LVDD was observed in gout patients with AH.

Thus, analyzing the above results, it can be concluded that the changes in LV architecture and its diastolic dysfunction are different in patients with gout, and it depends on the course of the disease, the type of LV geometry, and the presence or absence of AH.

Thus, the co-occurrence of cardiovascular damage (AH and CVD) with gout not only increases the risk of each disease but also increases the number of new cardiovascular diseases and the number of deaths resulting from them, in general, from diseases of the circulatory system. increases the risk of morbidity and mortality. Based on the current needs of such patients, the development of optimal treatment and diAHnostic methods requires an individual approach to patients. Choosing the right direction in the process of transporting these patients, and using preventive methods correctly can prevent serious complications from diseases and reduce the death rate.

Cardiovascular damage such as arterial hypertension, ischemic heart disease, and chronic heart failure is observed with high frequency in patients with gout. The degree of severity and clinical appearance of these lesions differ in the chronic course of gout.

The combination of gout and cardiovascular damage is characterized by severe jSInt syndrome in patients, damage to a large number of jSInts, and a high disease severity index, as well as comorbid diseases. Type 2 diabetes is associated with metabolic syndrome.

A high level of cumulative coronary risk is noted in patients with gout (54.4%), and its level is directly correlated with the clinical course of the main disease and risk factors. The most common risk factors for cardiovascular damage are AH (72.45%), decreased VLDL (70.1%), increased cholesterol (66.05%), additional factors - visceral obesity (90.1%) and hypertriglyceridemia (51.5 %) occurs, and develops in connection with the clinical course of the main disease.

In every fourth patient with gout, there is no violation of LV architecture, in almost a third of patients, CHLV is formed, in 26.7% of cases, LVEG is observed, and in one-fifth of patients, there are changes in its cavity, while the normal index of myocardial mass of LV is preserved. observed (CRLV). LVDD occurs in 34.09% of patients with gout. Structural and functional changes of the myocardium in gout

are different and depend on the clinical course of the disease, the type of LV geometry, and the presence or absence of AH.

The effectiveness of the drug febuxostat for hypouricemic therapy in combination with a complex approach in patients with gout and MSIts effectiveness is high in achieving the target indicators of the amount of SC (SC < 458 μmol/l) and normalization of ABQ and blood lipid spectrum.

1. Arif B.E., J.Jiaojiao, T.Sitter [et al.].//Genetics of serum urate concentrations and gout in a high-risk population, patients with chronic kidney disease / -DSI 10.1038/s41598-018-31282-z //Sci Rep.-2018.- № 8.- P.131384.

2. А.С.Мелехина., Громова М.А., Цурко В.В., Рационально-обоснованный подход к питанию у больных подагрой. Клиницист. 2019;13(3-4):15-21.

3. Averinova S., Gromova M., Tsurko V., Kashkadayeva A., Aliokhin A. Assessment of the kidneys and urinary tract dysfunctions that increase the risk of developing chronic kidney disease in patients with gout based on complex renal scintigraphy. Annals of the Rheumatic Diseases. 2019;78(2):1903-1904.

4. А.В. Щербак, Т.Ю. Стахова, Л.В. Козловская [и др.] // Клиническое значение определения маркеров дисфункции эндотелия (эндотелин-1, микроальбуминурия) и поражения тубулоинтерстициальной ткани ф2-микроальбумин, моноцитарный хемотаксический белок-1) у пациентов с артериальной гипертонией и нарушением обмена мочевой кислоты //Терапевтический архив. - 2014. -№ 6. - С. 45-51.

5. А.В. Говорин., Кушнаренко Н.Н. Особенности структурно-функциональных нарушений левого желудочка у больных подагрой в сочетании с артериальной гипертензией и хронической болезнью почек /Н.Н. Кушнаренко, Т.А. Медведева, А.В. Говорин. - DSI 10.18705/1607-419X-2017-23-6-529-542 //Артериальная гипертензия.-2017.- № 23(6).- С. 529-542.

6. Аверинова С.Г., Громова М.А., Цурко В.В., Кашкадаева А.В., Захарова Т.В. Радионуклидный скрининг и мониторинг функционального состояния мочевой системы для прогнозирования риска хронической болезни почек у больных подагрой (Технология СЭНС-КР).Клиническая геронтология. 2019;25(3-4):5-32.

7. A. Tugores, Martínez-Quintana E. Serum uric acid levels and cardiovascular disease: the Gordian knot / E. Martínez-Quintana, A. Tugores, F. RodríHYez-González. - DSI 10.21037/jtd.2016.11.39 // J Thorac Dis. - 2016. - № 8 (11). - P. E1462-E1466. 122.

8. Arun Kumar, E.Mohammed, L.D. Browne, A.U. [et al.]. Prevalence and treatment of gout among patients with chronic kidney disease in the Irish health system: A national study /- DSI 10.1371/journal.pone.0210487 // PLoS One.-2019. - № 14 (1).

9. Austrian nutrition and lifestyle recommendations for gout and hyperuricemia. Z Rheumatol. // TCutner J., Eichbauer-Sturm G., Gruber J., Puchner R., Spellitz P., Strehblow C. et al. 2015;74(7):631-636.

10. Aati O., TCpsford M., Gamble G.D., Knight J., Horne A., Doyle A.J., Dalbeth N. Relationship of bone erosion with the urate and soft tissue components of the tophus in gout: a dual energy computed tomography study.Rheumatology.2017;56:129-133.

11. A.B. Klein, M.H. Pillinger, S. Bangalore[et al.]. Cardiovascular Disease and Gout: Real-World Experience Evaluating Patient Characteristics, Treatment Patterns, and Health Care Utilization /- DSI 10.18553/jmcp.2017.23.6.677 // J ManAH Care Spec Pharm. - 2017. - № 23 (6). - P. 677-683.

12. A systematic review of ultrasonography in gout and asymptomatic hyperuricaemia. AnnRheum Dis. // Chowalloor P.V., Keen H.I. 2013; No72(5):638

13. Amaro S., Chamorro A., Castellanos M., et al. TCfety and efficacy of uric acid in patients with acute stroke (URICO-ICTUS): a randomised, double-blind phase 2b/3 trial. Lancet Neurol 2014; No13:453–60

14. A. Kei, F. Koutsouka, A. Makri [et al.]. Uric acid and cardiovascular risk: What genes can TCy / - DSI 10.1111/ijcp.13048 // Int J Clin Pract. - 2018. - № 72 (1). - P. 109.

15. A. Leiba, S. Vinker, D. Dinour [et al.]. Uric acid levels within the normal range predict increased risk of hypertension: a cohort study /- DSI 10.1016/j.jash.2015.05.010 // J Am Soc Hypertens. - 2015. - № 9 (8). - P. 600-9

16. Arromdee E. Epidemiology of Gout: Is the Incidence Rising? / E. Arromdee, C.J. Michet, C.S. Crowson // J. Rheumatol. - 2002. - Vol. 29. - P. 2403-2406.

17. Almdal T. The independent effect of type 2 diabetes mellitus on 113 ischemic heart disease, stroke, and death: a population-based study of 13,000 men and women with 20 years of follow-up / T. Almdal, H. Scharling, J.S. Jensen // Arch. Intern. Med. - 2004. - Vol. 164. - P. 1422.

18. Авдеева О.С. Распространенность метаболического синдрома среди больных ревматологического профиля / О.С. Авдеева, Е.А. Беляева, А.А. Хадарцев // Фундаментальные исследования. - 2008. - № 2. - С. 24-25.

19. Becker M.A., White W.B., TCAH K.G., Borer J.S., Gorelick P.B., Whelton A. et al. Cardiovascular TCfety of Febuxostat or Allopurinol in Patients with Gout. N Engl J Med. 2018;378(13):1200-1210. https://dSI.org/10.1056/nejmoa1710895.

20. Baker J.F. Serum uric acid and cardiovascular disease: recent developments, and where do they leave us? / J.F. Baker, E. Krishnan, L. Chen // Am. J. Med. - 2005. - Vol. 118. - P. 816-826.

21. Berbari A. The role of uric acid in hypertension, cardiovascular events and chronic kidney disease/A.Berbari/ESH Scientific Newsletter-2010-Vol.11-P. 49

22. Bickel C. Serum uric acid as an independent predictor of mortality in patients with angiographically proven coronary artery disease / C. Bickel, H.J. Rupprecht, S. Blankenberg // Am. J. Cardiol. - 2002. - Vol. 1, № 89. - P. 12- 17.

23. Bieber J.D. Gout. On the brink of a novel therapeutic options for an ancient disease / J.D. Bieber, R.A.Terkeltaub //Arthritis Rheum.-2004-Vol.50.-P.2400-2414.

24. Bos M.J. Uric acid is a risk factor for myocardial infarction and stroke: the Rotterdam Study / M.J. Bos, P.J. Koudstaal, A. Hofman // Stroke. - 2006. - Vol. 37.- P. 1503-1507. 114

25. Butler R. Allopurinol normalizes endothelial dysfunction in type 2 diabetics with mild hypertension / R. Butler, A.D. Morris, J.J. Belch // Hypertension. - 2000. - Vol. 35. - P. 746-751.

26. Bardin T. Impact of comorbidities on gout and hyperuricaemia: an update on prevalence and treatment options / T. Bardin, P. Richette. - DSI 10.1186/s12916-017-0890-9.//Impact of comorbidities on gout and hyperuricaemia: an update on prevalence and treatment options.-2017.-№ 15(1).- P. 123.

27. Bardin T., Bouée S., Clerson P., et al. Prevalence of gout in the Adult Population of France. Arthritis Care Res(Hoboken). 2016; No68:261–6

28. Барскова В.Г, Маркелова Е.И. Артериальная гипертония при подагре: особенности этиологии, патогенеза и диагностики / Е.И. Маркелова, М.С. Елисеев, В.Г. Барскова // Доктор.Ру. - 2012. - № 6 (74). - С. 44-8.

29. Барскова В.Г, Маркелова Е.И. Гипертрофия миокарда левого желудочка у больных подагрой / Е.И. Маркелова, Ю.О. Корсакова, В.Г. Барскова // Сибирский медицинский журнал. - 2013. - № 1. - С. 52-58.

30. Doehner W. Effects of xanthine oxidase inhibition with allopurinol on endothelial function and peripheral blood flow in hyperuricemic patients with chronic heart failure: results from 2 placebo-controlled studies / W. Doehner, N. Schoene, M. Rauchhaus // Circulation. - 2002. - Vol. 105. - P. 2619-2624.

31. Domrongkitchaiporn S. Risk factors for development of decreased kidney function in a southeast Asian population: a 12-year cohort study / S. Domrongkitchaiporn, P. Sritara, C Kitiyakara // J. Am. Soc. Nephrol. - 2005. - Vol. 16.-P. 791-799.

32. DeTCi C.S. Competing cardiovascular outcomes associated with electrocardiographic left ventricular hypertrophy: the Atherosclerosis Risk in Communities Study / C.S. DeTCi, H. Ning, D.M. Lloyd-Jones. - DSI 10.1136/heartjnl-2011-300819 // Heart. - 2012. - № 98 (4). - P. 330-4.

33. Dalbeth N., Schumacher H.R., Fransen J., et al. Survey definitions of gout for epidemiological studies: Comparisonwith crystal identification as the gold standard. Arthritis Care Res (Hoboken). 2016 Mar 25. dSI: 10.1002/acr.22896.Epub agead of print

34. Дзизинский А.А. Хроническая сердечная недостаточность: пособие для врачей / А.А. Дзизинский. - Иркутск, 2001. - С. 42.

35. Дороднева Е.Ф. Метаболический синдром / Е.Ф. Дороднева, Т.А. Пугачева, И.В. Медведева // Тер. архив. - 2002. - № 10. - С. 7-12.

36. Eckel R.H. Prevention Conference VII: Obesity, a worldwide epidemic related to heart disease and stroke: executive summary / R.H. Eckel, D.A. York, S. Rossner // Circulation. - 2004. - Vol. 110. - P. 2968.

37. Egan B.M. Nonesterified fatty aids in blood pressure control and cardiovascular complications / B.M. Egan, E.L. Greene, T.L. Goodfriend // Curr. Hypertens. Rep. - 2001. - Vol. 3, № 2. - P. 107-116.

38. ErdoganD. Relationship of serum uric acid to measures of endothelial function and atherosclerosis in healthy adults / D. Erdogan, H. HYllu, M. CaliUAan // Int. J. Clin. Pract. - 2005. - Vol. 59. - P. 1276-1282.

39. Executive summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) // JAMA. - 2001. - Vol. 285, № 19. - P. 2486-2497.

40. Evaluation of the Relationship Between Serum Uric Acid Levels and Cardiovascular Events in Patients With Gout: A Retrospective Analysis Using Electronic Medical Record Data / M.N. Essex, M. Hopps, E.J. Bienen [et al.]. - DSI10.1097/RHU.0000000000000496 // J Clin Rheumatol. - 2017. - № 23 (3). - P. 160166.

41. Epidemiology and manAgement of gout patients attending rheumatology tertiary centre in Perak, Malaysia / W. Sulaiman, N.W. Md Zuki, N. Zamri Arun Kumar [et al.] // PLoS One. - 2019. - № 2 (1). - P. 20-27.

42. Елисеев М.С., Владимиров С.А. Распространенность и клинические особенности подагры и болезнидепонирования пирофосфата кальция у пациентов с острым артритом. Научно-практическая ревматология.2015; No4: с.375-378

43. Елисеев М.С. Нарушения углеводного обмена при подагре: частота выявления и клинические особенности / М.С. Елисеев, В.Г. Барскова // Тер. архив. - 2010. - № 5. - С. 50-54.

44. Елисеев М.С., Желябина О.В., Мукагова М.В., Насонов Е.Л. Клинический опыт применения блокатораинтерлейкина-1β у больных хронической тофусной подагрой: купирование артрита и профилактика обострений при назначении аллопуринола.Современная ревматология.2015;No9(2):с.16-22.

45. Epidemiology and manAgement of gout in Taiwan: a nationwide population study / C.F. Kuo, M.J. Grainge, L.C. See [et al.]. - DSI: 10.1186/s13075-015-0522-8 // Arthritis Res Ther. - 2015. - № 17 (1). - P. 1-13.

46. Fang J. Serum uric acid and cardiovascular mortality: The NHANES I epidemiologic follow up study, 1971-1992. National Health and Nutrition Examination Survey / J. Fang, M.H. Alderman // JAMA. - 2000. - Vol. 238. - P. 2404-2410.

47. Farquharson C.A. Allopurinol improves endothelial dysfunction in chronic heart failure / C.A. Farquharson, R. Butler, A. Hill // Circulation. - 2002. - Vol. 106.- P. 221-226.

48. Feig D.I. Uric acid and cardiovascular risk / D.I. Feig, D.H. Kang, R.J. Johnson // N. Engl. J. Med. - 2008. -Vol. 359. - P. 1811-1821.

49. Feig D.I. Uric acid, nephron number, and the pathogenesis of essential hypertension / D.I. Feig, T. NakAHawa, S.A. Karumanchi // Kidney Int. - 2004. - Vol. 66.-P. 281-287.

50. Ford E.S. Prevalence of the metabolic syndrome among US adults: 118 findings from the third National Health and Nutrition Examination Survey / E.S. Ford, W.H. Giles,W.H.Dietz // JAMA.-2002.-Vol. 287, № 3. - P. 356- 359.

51. Ford E.S. Serum concentrations of uric acid and the metabolic syndrome among US children and adolescents / E.S. Ford, C. Li, S. Cook // Circulation. - 2007. - Vol. 115. - P. 2526-2532.

52. Forman J.P. Plasma uric acid level and risk for incident hypertension among men / J.P. Forman, H. ChSI, G.C. Curhan // J. Am. Soc. Nephrol. - 2007. - Vol. 18.- P. 287-292.

53. Forman J.P. Uric Acid and Insulin Sensitivity and Risk of Incident Hypertension / J.P. Forman, H. ChSI, G.C. Curhan // Arch. Intern. Med. - 2009. - Vol. 169.-P. 155-162.

54. Franklin S.S. Does the relation of blood pressure to coronary heart disease risk change with AHing?: the Framingham Heart Study / S.S. Franklin, M.G. Larson, S.A. Khan // Circulation. - 2001. - Vol. 103. - P. 1245.

55. Gersch M.S. Fructose, but not dextrose, accelerates the progression of chronic kidney disease / M.S. Gersch, W. Mu, P. Cirillo // Am. J. Physiol. Renal. Physiol. - 2007. - Vol. 293. - P. F1256-F1261. 119

56. Glushakova O. Fructose induces the inflammatory molecule ICAM-1 in endothelial cells / O. Glushakova, T. Kosugi, C Roncal // J. Am. Soc. Nephrol. - 2008. -Vol. 19.-P. 1712-1720.

57. Goya W.S. Serum uric acid is not an independent risk factor for coronary heart disease / W.S.Goya //Current Hypertension Reports.-2001. - Vol. 3.-P. 190-196.

58. HYthikonda S. Xanthine oxidase inhibition reverses endothelial dysfunction in heavy smokers / S. HYthikonda, C. Sinkey, T. Barenz // Circulation.-2003.-Vol. 107.-P. 416-421.

59. Грачёв А.В. Масса миокарда левого желудочка, его функциональное состояние и диастолическая функция сердца у больных артериальной гипертонией при различных эхокардиографических типах геометрии левого желудочка сердца / А.В. Грачёв, А.Л. Аляви, Г.У. Ниязова // Кардиология. - 2000. -№3. - С. 31-38.

60. Gout, not hyperuricemia alone, impairs left ventricular diastolic function / J.C. Lin, M.C. Chen, P.J. Chang [et al.]. - DSI 10.1186/s13075-015-0842-8 // Arthritis Res Ther. - 2015. - № 17. - P. 323.

61. Hyperuricemia and uncontrolled hypertension in treated hypertensive patients: K-MetS Study / J. Cho, C. Kim, D.R. Kang [et al.]. - DSI 10.1097/01.md.0000503535.96686.ae // Medicine (Baltimore). - 2016. - № 95 (28). -P.e 4177.

62. Hyperuricemia and risk of incident hypertension: a systematic review and metaanalysis of observational studies / J. Wang, T. Qin, J. Chen [et al.]. - DSI 10.1371/journal.pone.0114259 // PloS One. - 2014. - № 9. - e114259.

63. HaydenM.R. Uric acid: a new look at an old risk marker for cardiovascular disease, metabolic syndrome, and type 2 diabetes mellitus: The urate redox shuttle / M.R. Hayden, S.C. TyAHi // Nutrition Metabolism. - 2004. - Vol. 1,№ 10.-P. 34-37.

64. Heinig M. Role of uric acid in hypertension, renal disease, and metabolic syndrome / M. Heinig, R.J. Johnson // Cleveland Clinic Journal of Medicine. - 2006. - Vol. 73. - P. 1059-1064.

65. HSIeggen A. The impact of serum uric acid on cardiovascular outcomes in the LIFE study / A. HSIeggen, M.H. Alderman, S.E. Kjeldsen // Kidney Int. - 2004.- Vol. 65.-P. 1041-1049. 120

66. Interpretation of erythropSIetin and haemoglobin levels in patients with various stAges of chronic kidney disease / M. Panjeta, I. Tahirovi, E. Sofi [et al.]. - DSI 10.1515/jomb-2017-0014 // J Med Biochem.-2017.-№36 (2). - P. 145-152. 137.

67. Imazu M. Hyperinsulinemia for the development of hypertension: data from the Hawaii-Los Angeles-Hiroshima Study / M. Imazu, H. Yamamoto, M. Toyofuku//Hypertens. Res. -2001. -Vol. 24. -P . 531-536.

68. Indraratna P.L. Hyperuricemia, cardiovascular disease, and the metabolic syndrome / P.L. Indraratna, K.M. Williams, G.G. Graham // J. Rheumatol. - 2009. - Vol. 36. - P. 2842-2843.

69. Janssens H.J. Gout, just a nasty event or a cardiovascular signal? A study from primary care / H.J. Janssens, E.H. Van de Lisdonk, H. Bor // Family Practice. - 2003. - Vol. 20, № 4. -P . 413-417.

70. Johnson R.J. Is There a Pathogenetic Role for Uric Acid in Hypertension and Cardiovascular and Renal Disease? / R.J. Johnson, D-H. Kang, D. Feig // Hypertension. - 2003. - Vol. 41. - P. 1183-1189.

71. Jalal DI. Hyperuricemia, the kidneys, and the spectrum of associated diseases: a narrative review. - DSI 10.1080/03007995.2016.1218840 // Curr Med Res Opin. - 2016. - № 32 (11). - P. 1863-1869.

72. Kang D.H. Hyperuricemia and Progression of Chronic Kidney Disease: Role of Phenotype Transition of Renal Tubolar and Endothelial Cells. - DSI 10.1159/000484278 // Contrib Nephrol. - 2018. - № 192. - P. 48-45.

73. Кобалава Ж.Д. Мочевая кислота - маркёр и/или новый фактор риска развития сердечно-сосудистых осложнений? / Ж.Д. Кобалава, В.В. Толкачёва, Ю.Л. Караулова // Русс. мед. журнал.-2002.- № 10. - С. 431-437.

74. Кушнаренко Н.Н. Сердечно-сосудистые нарушения у мужчин с подагрой: клинические особенности, механизмы развития, прогнозирование: автореф. дис. ... д-ра мед. наук / Н.Н. Кушнаренко. - Чита, 2012. - 53 с.

75. Кобалава Ж.Д. Основы кардиоренальной медицины / Ж.Д. Кобалава, С.В. Виллевальде, М.А. Ефремцева. - Москва: ГЭОТАР-Медиа, 2014. - 256 с. - ISBN 978-5-9704-3040-8.

76. Kanbay M. Uric Acid in Hypertension and Renal Disease: The Chicken or the Egg? / M. Kanbay, Y. Solak, E. Dogan //Blood Purif.-2010.-Vol.30.-P.288-295.

77. Kang D.H. A role for uric acid in the progression of renal disease / D.H. Kang, T. NakAHawa, L. Feng // J. Am. Soc. Nephrol. - 2002. - Vol. 13. - P. 2888-2897.

78. Kim J.A. Reciprocal relationships between insulin resistance and endothelial dysfunction: molecular and pathophysiological mechanisms / J.A. Kim, M. MontAHnani, K.K. Koh // Circulation. - 2006. - Vol. 113. - P. 1888-1904.

79. Klein R. Serum uric acid. Its relationships to coronary heart disease risk factors and cardiovascular disease, Evans County, Georgia / R. Klein, B.E. Klein, J.C. Cornoni // Arch. Intern. Med. - 1973. - Vol. 132. - P. 401-410. 121

80. Krishnan E. Gout and the risk of acute myocardial infarction / E. Krishnan, J.F. Baker, D.E. Furst // Arthritis Rheum. - 2006. - Vol. 54. - P. 2688-2696.

81. Krishnan E. Hyperuricemia and incidence of hypertension among men without metabolic syndrome / E. Krishnan, C.K. Kwoh, H.R. Schumacher // Hypertension. - 2007. - Vol. 49. - P. 298-303.

82. Коваль С.Н. Нарушения пуринового обмена и артериальная гипертензия / С.Н. Коваль, В.В. Божко, О.В. Мысниченко // Украинский ревматологический журнал. - 2009. - № 4. - С. 75-80.

83. Куницкая Н.А. Сердечно-сосудистые заболевания и подагра / Н.А. Куницкая, В.И. Мазуров // Артериальная гипертензия.- 2008 - № 2. - С. 48.

84. Longitudinal Association Between Serum Uric Acid and Arterial Stiffness: Results From the Baltimore Longitudinal Study of AHing / M. Canepa, F. Viazzi, J.B. Strait [et al.]. - DSI 10.1161/HYPERTENSIONAHA.116.08114 // Hypertension. -2017. - № 69 (2). - P. 228-235.

85. Lakka H.M. The metabolic syndrome and total and cardiovascular disease mortality in middle-Aged men / H.M. Lakka, D.E. Laaksonen, T.A. Lakka // JAMA. - 2002. - Vol. 288. - P. 2709-2716.

86. Lawrence R.C. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States: part II / R.C. Lawrence, D.T. Felson, C.G. Helmick // Arthritis Rheum. - 2008. - Vol. 58. - P. 26-35.

87. Lee J.E. Serum uric acid is associated with microalbuminuria in prehypertension / J.E. Lee, Y.G. Kim, Y.H. ChSI // Hypertension. - 2006. - Vol. 47.- P. 962-967.

88. Lewington S. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies / S. Lewington, R. Clarke, N. Qizilbash // Lancet. - 2002. - 122 Vol. 360.-P. 1903.

89. LuZ.S. Association between hyperuricemia and hypertension in a Chinese population at a high risk of hypertension / Z.S. Lu, Z.H. Lu, H. Lu // Blood Press. - 2009. - Vol. 18. - P. 268-272.

90. Логинова Т.К. Ранний подагрический артрит. Связь с метаболическим синдромом / Т.К. Логинова, И.А. Шостак // Сборник материалов V съезда ревматологов России. - М. - 2009. - С. 65.

91. Madero M. Uric acid and long-term outcomes in CKD / M. Madero, M.J. TCrnak, X. Wang // Am. J. Kidney Dis. - 2009. - Vol. 53. - P. 796-803.

92. Masuo K. Serum uric acid and plasma norepinephrine concentrations predict subsequent weight gain and blood pressure elevation / K. Masuo, H. KawAHuchi, H. Mikami // Hypertension. - 2003. - Vol. 42. - P. 474-480.

93. Mazzali M. Elevated uric acid increases blood pressure in the rat by a novel crystal-independent mechanism / M. Mazzali, J. Hughes, Y.G. Kim // Hypertension. - 2001. - Vol. 38. - P. 1101-1106.

94. Mazzali M. Hyperuricemia induces a primary renal arteriolopathy in rats by a blood pressure-independent mechanism / M. Mazzali, J. Kanellis, L. Han // Am. J. Physiol. Renal Physiol. - 2002. - Vol. 282. - P. F991-F997.

95. MellenP.B. Serum uric acid predicts incident hypertension in a biethnic cohort: the Atherosclerosis Risk in Communities study / P.B. Mellen, A.J. Bleyer, T.P. Erlinger // Hypertension. - 2006. - Vol. 48. - P. 1037-1042.

96. Mercuro G. Effect of hyperuricemia upon endothelial function in patients at increased cardiovascular risk / G. Mercuro, C. Vitale, E. Cerquetani // Am. J. Cardiol. - 2004. - Vol. 94. - P. 932-935. 123

97. MiuraK. Relationship of blood pressure to 25-year mortality due to coronary heart disease, cardiovascular diseases, and all causes in young adult men: The ChicAHo Heart Association detection project in industry / K. Miura, M.L. Daviglus, A.R. Dyer // Arch. Intern. Med. - 2001. - Vol. 161. -P . 1501.

98. Monu J.U.V. Gout: a clinical and radiologic review / J.U.V. Monu, T.L Jr. Pope // Radiol. Clin. N. Am. - 2004. - Vol. 42. - P. 169-184.

99. Мартынов А.И. Гипертрофия миокарда левого желудочка при артериальной гипертонии: клиническое значение, диагностика, влияние антигипертензивных препаратов / А.И. Мартынов, О.Д. Остроумова, В.И. Мамаев // Клиническая медицина. - 2000. - № 10. - С. 10-17

100. Молекулярно- генетические аспекты ИБС при бессимптомной гиперурикемии в Ўзбекистане// Ташкенбаева Э.Н., Зиядуллаев Ш.Х., Тогаев Д.Х.// “Muxr Press”-2020

101. Мамедов М.Н. Метаболический синдром: пути реализации атеротромбогенного потенциала / М.Н. Мамедов, В.А. Метельская, Н.В. Перова // Кардиология. - 2000. - № 2. - С. 83-89. 109

102. М.В. Ледяхова Гиперурикемия как предиктор хронической сердечной недостаточности / М.В. Ледяхова, С.Н. Насонова, С.Н. Терещенко. - DSI https://dSI.org/10.20996/1819-6446-2015-11-4-355-358 // Рациональная фармакотерапия в кардиологии. - 2015. - № 11 (4). - С. 355-358.

103. Мясоедова С.Е. Подагра: современные алгоритмы диагностики и лечения в условиях реальной практики терапевта и ревматолога. Ревматология/неврология. Спецвыпуск № 4, 2017

104. Мухин Н.А. Хронические прогрессирующие нефропатии и образ жизни современного человека / Н.А. Мухин, И.М. Балкаров, СВ. Моисеев // Тер. архив. - 2004. - № 9. - С. 5-10.

105. Маркелова Е.И. Значение суточного мониторирования артериального давления в диагностике артериальной гипертонии у больных подагрой / Е.И. Маркелова, В.Г. Барскова, Е.В. Ильиных, Е.Л. Насонов // Научно-практическая ревматология. - 2010. - № 1. - С. 61-66.

106. №24.-С . 1619-1621. 16. Ильина А.Е. Подагра, гиперурикемия и кардиоваскулярный риск / А.Е. Ильина, В.Г. Барскова, Е.Л. Насонов // Научно-практическая ревматология. - 2009. - № 1. - С. 56-62.

107. NAHahama K. Hyperuricemia as a predictor of hypertension in a screened cohort in Okinawa, Japan / K. NAHahama, T. Inoue, K. Iseki // Hypertens. Res. - 2004. - Vol. 27. - P. 835-841.

108. Nakanishi N. Serum uric acid and risk for development of hypertension and impaired fasting glucose or type II diabetes in Japanese male office workers / N. Nakanishi, M. Okamoto, H. Yoshida // Eur. J. Epidemiol. - 2003.-Vol.18.-P. 523-530.

109. NiUAanen L.K. Uric acid level as a risk factor for cardiovascular and al 1-cause mortality in middle-Aged men: a prospective cohort study / L.K. NiUAanen // Arch. Intern. Med. - 2004. - Vol. 164. - P. 1546.

110. Недогода С.В. Возможности коррекции гиперурикемии при метаболическом синдроме. - DSI https://dSI.org/10.21518/2079-701X-2014-2-18-25 // Медицинский совет. - 2014. - № 2. - С. 18-24.

111. Насонов Е.Л. Механизмы развития подагрического воспаления / Е.Л. Насонов, В.А. Насонова, В.Г. Барскова //Тер. архив. - 2006. -Т.78,№ 6.-С. 77-84.

112. Насонова В.А. Ранние диагностика и лечение подагры - научно обоснованное требование улучшения трудового и жизненного прогноза по больных / В.А. Насонова, В.Г. Барскова // Научно-практическая ревматология. - 2004. - № 1. - С. 5-7.

113. Нематова И.А. Течение артериальной гипертонии у больных подагрой / И.А. Нематова, Е.В. Искандарова, М.З. Ризамухамедова // Системные ревматические болезни и спондилиты : тез. докл. ежегод. науч.- практ. конф. - Москва, 2010. - С. 36.

114. Obermayr R.P. Elevated uric acid increases the risk for kidney disease / R.P. Obermayr // J. Am. Soc. Nephrol. - 2008. - Vol. 19. - P. 2407-2413.

115. OhnSI. Frequency of gouty arthritis in patients with end-stAge renal disease in Japan /1.Ohno, K. Ichida,H.Okabe // Internal Med.-2005.- Vol. 44, № 7. - P. 706-709.

116. Onat A. Metabolic syndrome: major impact on coronary risk in a 124 population with low cholesterol levels: a prospective and cross-sectional evaluation / A. Onat, K. Ceyhan, O. BaTCr // Atherosclerosis. - 2002. - Vol. 165. - P. 285-292.

117. Ouppatham S. The relationship of hyperuricemia and blood pressure in the Thai army population / S. Ouppatham, S. Bancha, P. Choovichian // J. Postgrad. Med. - 2008. - Vol. 54 - P. 259-262.

118. Ощепкова Е.В. Есть ли связь уровня мочевой кислоты с доклиническим поражением органов-мишеней у больных гипертонической болезнью среднего и высокого риска? / Е.В. Ощепкова, В.Н. Титов // Терапевтический архив: научно-практический журнал. - 2013. - Т. 85, № 9. - С. 52-57.

119. Pearson TA. AHA HYidelines for Primary Prevention of Cardiovascular Disease and Stroke: 2002 Update: Consensus Panel HYide to Comprehensive Risk Reduction for Adult Patients Without Coronary or Other Atherosclerotic Vascular Diseases / TA. Pearson, S.N. Blair, S.R. Daniels // Circulation. - 2002. - Vol. 106. - P. 388-391.

120. Perlstein T.S. Uric acid and the development of hypertension: the Normative AHing Study / T.S. Perlstein, O. HYmieniak, G.H. Williams // Hypertension. -2006. - Vol. 48. -P . 1031-1036.

121. Post-transplant Hyperuricemia as a Cardiovascular Risk Factor / M. Erkmen Uyar, S. Sezer, Z. Bal [et al.]. - DSI 10.1016/j.transproceed.2015.03.004 // Transplant Proc. - 2015. - № 47 (4). - P.1146-51.

122. Подзолков В.И. Применение нифедипина у больных с гипертоническим поражением сердца / В.И. Подзолков, В.В. Самойленко, В.И. Маколкин // Кардиология. - 2000. - № 10. - С. 42-46.

123. Qu L.H. Effect of uric acid-lowering therapy on blood pressure: systematic review and meta-analysis / L.H. Qu, H. Jiang, J.H. Chen. - DSI 10.1080/07853890.2016.1243803 // Ann Med. - 2017. - № 49 (2). - P. 142-156.

124. Resnick H.E. Insulin resistance, the metabolic syndrome, and risk of incident cardiovascular disease in nondiabetic American Indians: the Strong Heart Study / H.E. Resnick, K. Jones, G. Ruotolo//Diabetes Care. - 2003. - Vol. 26. - P. 861-867.

125. Ревматология: Российские клинические рекомендации. Под редакцией Е.Л. Насонова. М.:ГЭОТАР-Медиа, 2017.

126. Serum uric acid levels and mortality in the Japanese population: the YamAHata (Takahata) study / K. Kamei, T. Konta, K. Ichikawa [et al.]. - DSI 10.1007/s10157-016-1228-1 // Clin Exp Nephrol. - 2016. - № 20 (6). - P. 904-909.

127. TCAHK.G. Recent advances in the epidemiology of gout / K.G. TCAH, T.R. Mikuls // Curr. Rheumatol. Rep. - 2005. - Vol. 7. - P. 235-241.

128. TCnchez-Lozada L.G. Effects of acute and chronic L-arginine treatment in experimental hyperuricemia / L.G. TCnchez-Lozada, E. Tapia, R. Lopez-Molina //Am. J. Physiol. Renal Physiol. - 2007. - Vol. 292.-P. F1238-F1244.

129. TCnchez-Lozada L.G. Treatment with the xanthine oxidase inhibitor febuxostat lowers uric acid and alleviates systemic and glomerular hypertension in experimental hyperuricaemia / L.G. TCnchez-Lozada, E. Tapia, V. Soto // Nephrol. Dial. Transplant. - 2008. - Vol. 23. - P. 1179-1185.

130. TCttar N. Metabolic syndrome with and without C-reactive protein as a predictor of coronary heart disease and diabetes in the West of Scotland Coronary Prevention Study / N. TCttar, A. Gaw, O. Scherbakova // Circulation. - 2003. - Vol. 108.-P. 414-419.

131. Sturm G. Uric acid as a risk factor for progression of non-diabetic chronic kidney disease? The Mild to Moderate Kidney Disease Study / G. Sturm, B. Kollerits, U. Neyer // Exp. Gerontol. - 2008. - Vol. 43. - P. 347- 352.

132. Sui X. Uric acid and the development of metabolic syndrome in women and men / X. Sui, T.S. Church, R.A. Meriwether // Metabolism. - 2008. - Vol. 57. - P. 845-852.

133. Sundstrom J. Relations of serum uric acid to longitudinal blood pressure tracking and hypertension incidence / J. Sundstrom, L. Sullivan, R.B. D'AHostino // Hypertension. - 2005. - Vol. 45. - P. 28-33.

134. Serum uric acid levels and mortality in the Japanese population: the YamAHata (Takahata) study / K. Kamei, T. Konta, K. Ichikawa [et al.]. - DSI 10.1007/s10157-016-1228-1 // Clin Exp Nephrol. - 2016. - № 20 (6). - P. 904-909.

135. Shankar A. The association between serum uric acid level and longterm incidence of hypertension: population-based cohort study / A. Shankar, R. Klein, B.E. Klein // J. Hum. Hypertens. - 2006. - Vol. 20. - P. 937-945. 126

136. Шилов Е.М. Нефрология /Е.М.Шилов. -М.:ГЭОТАР-Медиа,2007.-697 с.

137. Шостак Н.А. Подагрический артрит: ранняя диагностика, взаимосвязь с метаболическим синдромом / Н.А. Шостак [и др.] // Системные 112 ревматические болезни и спондилиты : тез. ежегод. науч.-практ. конф. - Москва, 2010.-С. 62.

138. Щербакова О.А. Прогностическое значение изменений в крови процессов липопероксидации, содержания неэстерифицированных жирных кислот и адениловых нуклеотидов в развитии кардиогемодинамических нарушений у больных первичной подагрой: дис. ... канд. мед. наук / О.А. Щербакова. - Чита, 2011. - 199 с.

139. Calabro P. Intra-abdominal adiposity, inflammation, and cardiovascular risk: new insight into global cardiometabolic risk / P. Calabro, E.T. Yeh // Curr. Hypertens. Rep. - 2008. - Vol. 10. - P. 32-38.

140. Campo C. Hyperuricemia, low urine urate excretion and target organ damage in arterial hypertension / C.Campo [et al.] // Blood press. - 2003. - Vol. 12.-P. 277-283.

141. Cappola T.P. Allopurinol improves myocardial effeciency in patients with idiopathic dilated cardiomyopathy / T.P. Cappola, D.A. Kass, G.S. Nelson // Circulation. - 2001. - Vol. 104. - P. 2407-2411.

142. Carnethon M.R. Risk factors for progression to incident hyperinsulinemia: the Atherosclerosis Risk in the Communities Study, 1987-1998 / M.R. Carnethon, S.P. Fortmann, L. Palaniappan // Am. J. Epidemiol. - 2003. -Vol. 158.-P. 1058-1067. 115

143. Chang H.Y. Hyperuricemia as an independent risk factor of chronic kidney disease in middle-Aged and elderly population / H.Y. Chang, C.W. Tung, P.H. Lee // Am. J. Med. Sci. - 2010. - Vol. 339. - P. 509-515.

144. Chen S.Y. Severity of gouty arthritis is associated with Qwave myocardial infarction: a large-scale, cross-sectional study / S.Y. Chen, C.L. Chen, M.L. Shen // Clin. Rheumatol. - 2007. - Vol. 26. - P. 308-313.

145. Chobanian A.V. The Seventh Report of the JSInt National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report/ A.V. Chobanian, G.L. Bakris, H.R. Black // JAMA. - 2003. - Vol. 289, №19.-P . 2560-2572.

146. ChSI H.K. Purine-rich foods, dairy and protein intake, and the risk of gout in men / H.K. ChSI, K. Atkinson, E.W. Karlson // New Engl. J. Med. - 2004. -Vol. 350.-P. 1093-1103.

147. ChSI H.K. Independent impact of gout on mortality and risk for coronary heart disease / H.K. ChSI,G.Curhan //Circulation.-2007.-Vol.116. - P. 894- 900.

148. ChSI H.K. Prevalence of metabolic syndrome in individuals with hyperuricemia / H.K. ChSI, E.S. Ford // Am. J. Med. - 2007. - Vol. 120. - P. 442-447.

149. Corry D.B. Uric acid stimulates vascular smooth muscle cell proliferation and oxidative stress via the vascular renin-angiotensin system / D.B. Corry, P. Eslami, K. Yamamoto // J. Hypertens. - 2008. - Vol. 26. - P. 269- 275.

150. CuspidiC. Lack of association between serum uric acid and organ damage in a never - treated essential hypertensive population at low prevalence of hyperuricemia / C Cuspidi [et al.] // Am. J. Hypertens. - 2007. - Vol. 20. - P. 678-685.

151. Turtle K.R. Sex differences in uric acid and risk factors for coronary artery disease / K.R. Turtle, R.A. Short, R.J. Johnson // Am. J. Cardiol. - 2001. - Vol. 87.-P.1411-1414.

152. TaniHYchi Y. Serum uric acid and the risk for hypertension and Type 2 diabetes in Japanese men: the OTCka Health Survey / Y. TaniHYchi, T. Hayashi, K. Tsumura//J.Hypertens.-2001.-Vol. 19.-P. 1209-1215.

153. Tausche A-K. Gout - Current DiAHnosis and Treatment / A-K. Tausche, T.L. Jansen, H-E. Schroder // Dtsch. Arztebl. Int. - 2009. - Vol. 106. - P. 549-555.

154. Terkeltaub R.A. Clinical practice. Gout / R.A. Terkeltaub // N. Engl. J. Med. -2003.-Vol.349.-P. 1647-1655.

155. Third report of the National Cholesterol Education Program (NCEP) Expert Panel on detection, evaluation, and treatment of high blood cholesterol in 127 adults (Adult Treatment Panel III) // Circulation. - 2002. - Vol. 106. - P. 3143.

156. United States Renal Data System. http://www. usrds. org/ reference_2004.htm // Accessed May, 1. - 2007.

157. Uric acid and cardiovascular risk: What genes can TCy / A. Kei, F. Koutsouka, A. Makri [et al.]. - DSI 10.1111/ijcp.13048 // Int J Clin Pract. - 2018. - № 72 (1). - P. 109.

158. VaTCn R.S. Relative importance of borderline and elevated levels of coronary heart disease risk factors / R.S. VaTCn, L.M. Sullivan, P.W. Wilson // Ann. Intern. Med. - 2005. - Vol. 142. - P. 393.

159. VazHYez-Mellado J. Metabolic syndrome and ischemic heart disease in gout / J. VazHYez-Mellado, C.G. Garsia, S.G. VazHYez // J. Clin. Rheumatol. - 2004. - Vol. 10,№ 3.-P.105-109.

160. VerdecchiaP.Relation Between Serum Uric Acid and Risk of Cardiovascular Disease in Essential Hypertension. The PIUMA Study / P. Verdecchia, G. Schillaci, G.P. Reboldi // Hypertension. - 2000. - Vol. 36. - P. 1072-1078.

161. Villegas R. Prevalence and determinants of hyperuricemia in middleAged, urban Chinese men / R. Villegas, Y.B. Xiang, Q. Cai // Metab. Syndr. Relat. Disord. - 2010. -Vol. 8. - P. 263-270.

162. В.Г. Барскова, Денисов И.С. Исходы подагры. Обзор литературы. Часть 2.Коморбидные заболевания, риск развития сердечно-сосудистых катастроф и смерти при подагре // В.Г. Барскова, И.С. Денисов, М.С. Елисеев. - БО1 https://dSI.org/10.14412/1995-4484-2013-703-10 // Научно-практическая ревматология. - 2013. - № 51 (6). - С. 703-710.

163. Взаимосвязь степени инсулинорезистентности и уровня эндогенного кортизола у больных сахарным диабетом 2-го типа// У.К. Каюмов, П.П. Черныш, З.С. Акбаров, Ф.А Хайдарова, Н.Н. Максутова// Международный эндокринологический журнал 4 (36),2011.

164. В.В. Цурко, Громова М.А. Рационально-обоснованный подход к лечению подагры с учетом дебюта, течения и сочетанной патологии по материалам рекомендаций Европейской антиревматической (EULAR2016).Терапевтическийархив.2017;89(12):233,237.https://dSI.org/10.17116/terarkh20178912233-237.

165. В.В. Цурко, Громова М.А. Общие принципы и основные рекомендации по ведению и лечению пациентов с подагрой по материалам обновленных европейских рекомендаций. Consilium Medicum. 2017;19(12):20-24.

166. Wallace K.L. Increasing prevalence of gout and hyperuricemia over 10 years among older adult in a manAged care population / K.L. Wallace, A.A. Riedel, N. Joseph-Ridge//J. Rheumatol. -2004. -Vol. 31. -P . 1582-1587.

167. Waring W.S. Effect of local hyperucemia on endothelial function in the human forearm vascular bed / W.S. Waring, D.J. Webb, S.R.J. Maxwell // Br. J. Clin. Pharmacol. - 2000. - Vol. 49. - P. 511.

168. Watanabe S. Uric acid, hominSId evolution, and the pathogenesis of Salts-sensitivity / S. Watanabe, D.H. Kang, L. Feng // Hypertension. - 2002. - Vol. 40.-P. 355-360.

169. Wheeler J.G. Serum uric acid and coronary heart disease in 9,458 incident cases and 155,084 controls: prospective study and meta-analysis / J.G. Wheeler, K.D. Juzwishin, G. Eiriksdottir // Proc. Natl.Acad.Sci.Med.-2005.-Vol.2.-P . 76.

170. World Health Organization (WHO). Obesity: prevention and manAgement of the global epidemic. Report of the WHO Consultation // World Health Organ. Tech. Rep. Ser. - 2000. - Vol. 894. - P. 1-253.

171. Хатамова Д.Т., Абдухакимова Н.А., Каюмов У.К. // Частота и уровни некоторых основных компонентов метаболического синдрома у больных подагрой при сахарном диабете и нарушенной толерантности к глюкозе/ scholar. google.ru – журнал: Врач- аспирант-2009. № 3. – С. 182-186

172. Хатамова Д.Т., Каюмов У.К., М.С. Адилова М.С. // Результаты многолетних исследований метаболического синдрома //Конгресс

Ассоциации кардиологов стран СНГ и Ассоциации кардиологов Узбекистана,Ташкент-2005-С.15-17

173. Yusuf.S. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study / S. Yusuf, S. Hawken, S. Ounpuu // Lancet. - 2004. - Vol. 364. - P. 937.

174. Значение суточного мониторирования артериального давления в диагностике артериальной гипертонии у больных подагрой / Е.И. Маркелова, В.Г. Барскова, А.Е. Ильина [и др.]. - Б01 https://dSI.org/10.14412/1995-4484-2010-1407// Научно-практическая ревматология. -2010.-Т. 48, № 1. - С. 61-66.