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**STRUCTURAL-FUNCTIONAL CONDITION OF BONE TISSUE  
IN PATIENTS WITH A COMBINED COURSE OF GOUT AND  
OSTEOARTHRITIS**

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According to the WHO, osteoporosis belongs to the leading socially significant human diseases, such as malignant neoplasms, myocardial infarction, and stroke. The role of a physician in the early diagnosis of osteoporosis is to identify risk factors that reduce bone mass, to assess the probability of osteoporotic fractures, and to investigate the structural and functional status of bone tissue in people with diseases which cause secondary osteoporosis.

The problem of the comorbid pathology of patients is relevant for practical medicine. There is even the so-called theory of functional blocks, which considers the combination of several nosologies in a particular patient, not as separate isolated diseases from one another, which occur with a certain frequency, but as a pathogenetically determined disorientation of a certain functional block in many organs and systems. Based on this, osteoporosis in patients with comorbid pathology may be a complication of a combined course of illness, or vice versa, will cause a tandem of certain nosologies. And in this case, management of such patients will consist not only in the detection and therapy of diseases, but also in the correction of the impaired functional block, which creates polymorbidity.

The study of the mechanism of formation of secondary osteoporosis in people with comorbid pathology has led to the definition of screening research methods that would enable him to diagnose the diseases at early stages and in many people. Today there are several such methods, among which ultrasonic bone densitometry and laboratory diagnostics of mineral metabolism disorders are preferred.

Gout arthritis is one of the most common chronic diseases of the musculoskeletal system. Due to the high frequency of complications, the prevalence, progressive nature of the course of the disease, gout is one of the most urgent medical and social problems in the world. Particular attention is paid to the problem of comorbid states in gout, such as ischemic heart disease, diabetes mellitus, metabolic syndrome, arterial hypertension, and others. It has been shown that concomitant diseases and metabolic disorders in gout patients, especially when combined with them, are associated with a higher level of uric acid in serum and, consequently, a more severe course of arthritis. Scientists have proven that increasing the duration, severity of gout and age of patients increases the patient's polymorbidity, in which it is expedient to isolate comorbid conditions with gout-associated etiopathogenetic bonds, causative

mechanisms that increase the risk of complications and accidental comorbidities.

In the aspect of degenerative joint disease, the well-known fact is that in patients with osteoarthritis, there is a high comorbidity index. Recent epidemiological studies have shown that the metabolic syndrome has a major influence on the severity of osteoarthritis, because the plasma concentration of adipokines connected with this metabolic disorder. And it is adipokines that have pro-inflammatory effects. Hyperuricemia, which is one of the components of the metabolic syndrome, is also a diagnostic criterion for gout. Given the high prevalence of asymptomatic hyperuricemia, gout and osteoarthritis, the combined course of gout arthritis and degenerative joint damage is quite common comorbid disorder. At the previous stages of our research, we studied the frequency and mechanism of osteoporosis in patients with gout.

**The purpose** of this study is to assess the structural and functional state of bone tissue in patients with combined course of gout and osteoarthritis.

**Materials and Methods.** For the diagnosis of gout we used gout criteria S.L.Wallace et al. (1997) recommended by World Health Organization in 2000. The patients had various clinical forms and stages of gout: asymptomatic hyperuricemia (10 people), acute gout attack (5 people), intermittent gout (22), chronic gout (14 individuals). The criterion for inclusion in the study was also the diagnosis of osteoarthritis according to the criteria of the American Rheumatologic Association (the presence of the first (47.1%) and the second (52.9%) X-ray stage of osteoarthritis, the classification J.H. Kellgren and J.S. Lawrence).

Structural-functional state of bone (SFSB) we evaluated by ultrasound densitometry (apparatus LUNAR Achilles express, USA, 2008). Investigated parameters: Stiffness Index - bone strength index, which characterizes the density of bone (SD, standard deviation), T-score - bone density deviation of the patient from the mean value of this parameter in healthy elderly respective gender (SD, standard deviation); Z-score - bone density deviation of the patient from patient with the same age, sex, body weight (SD). Densitometric indices were evaluated in accordance with WHO recommendations regarding diagnostic criteria for osteoporosis: till -1 SD (standard deviation) is normal value; from -1 to -2.5 SD is osteopenia or preclinical stage of osteoporosis; -2.5 SD and more - definite osteoporosis; -2.5 SD and more in combination with an osteoporotic fracture is a severe form of osteoporosis.

**Results.** The study has been included 51 patients with primary gout in combination with osteoarthritis. 7 patients had tophi. The average age of patients was  $54.8 \pm 2.32$  years: 22 men (mean age -  $56.2 \pm 2.9$  years) and 29 women (mean age  $53.4 \pm 3.5$  years). Depending on the degree of hyperuricemia all patients have been divided into 2 groups: I group (17 patients) with hyperuricemia greater than 620 mmol/l; II group (24 persons) with uricemia 360-620 mmol/l. The control group has been included 20 healthy individuals of

appropriate age. In all patients, we have found disorders of structural-functional state of bone. SFSB examination of patients in both groups has been revealed a decrease in mineral density and disorders bone architectonics, which has been corresponded to osteopenia II degree (average value of T-score in both groups has been  $-1,75 \pm 0,08$  (SD). The values (SI and T-score) have been significantly smaller in the first group of patients. SI in the first group patients has been lower by 31.2%, while in the second group of patients (25.1%) in comparison with a group of healthy patients. We have identified an inverse correlation ( $r = -0,32$ ) between serum uric acid levels and SI of bone.

To evaluate the effect of the severity of osteoarthritis on the structural and functional status of bone tissue, we formed two groups of patients, depending on the radiological stage of osteoarthritis. In the group of patients with the first x-ray stage of osteoarthritis, the values of T-score were comparable, they were  $-1.67 \pm 0.09$  SD at the first radiological stage and  $-1.71 \pm 0.07$  SD in the second radiological stage.

**Conclusions.** In patients with combined gout and osteoarthritis, there are disorders of bone architectonics and a decrease mineral density. Structural-functional state of bone in patients with primary gout and degenerative joint disease undergoes changes, the severity of which depends on the degree of hyperuricemia. More significant changes observed in patients with hyperuricemia exceeding values 620mmol/l. The severity of osteoarthritis is not a determining factor that affects structural-functional state of bone.

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**EFFECT OF GINGER-GARLIC MIXTURE (ORGANIC NATURAL**  
**SPICE) ON THE EFFECTIVENESS OF COMPLEX THERAPY IN**  
**GHANAIS PATIENTS WITH HYPERTENSION AND**  
**CONCOMITANT DIABETES MELLITUS II**

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**Introduction.** Ginger is a common rhizome used in many parts of the world, especially in Africa. According to research from the University of Sydney, Australia, it was discovered that Ginger contained an active components called Gingerols. Gingerols have been found to increase the uptake of glucose from the blood into muscle cells without the insulin participation. Thus in turn reducing blood glucose by significantly. In the literature there are data on the positive effect of ginger on the state of the vascular wall and, in particular, on its vasodilatory effect in smaller peripheral arteries which aids in blood circulation. Increase blood circulation by physiology usually causes a thermogenic effect aiding in metabolism as well as calorie burning. From the