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Features Of The Course Of Hypertensic Disease With Deformating Osteoarthritis And Coordination Of Treatment

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Abstract: Increasing the combination of hypertension with osteoarthritis is a public health problem worldwide. Hypertension is associated with osteoarthritis and a high risk of adverse clinical outcomes. In our study, in patients receiving meloxikam, blood pressure increased significantly after treatment, and the proportion of "non-dipper" or extreme categories (over-dipper, night peaker) in 24-hour blood pressure monitoring was higher than in the control group. According to our research results, in the main group, the proportion of over dipper increased from 10% to 3.3% after treatment, dipper type from 46.67% to 60%, non-dipper type from 33.3% to 16.7%, and night peaker type from 10% to 20% (P<0.05). In the control group, these indicators decreased from 13.33% to 10%, from 43.33% to 46.67%, from 30% to 33.33%, and from 13.33% to 10% respectively (P>0.05). These results indicate that meloxicam can relatively worsen blood pressure in patients with hypertension and lead to the formation of latent hypertension.

Keywords: Hypertension, osteoarthritis, cardiovascular diseases, meloxicam, C-reactive protein, daily blood pressure monitoring.

Introduction: Osteoarthritis (OA) is the most common form of arthritis among the population[1]. The prevalence of OA among the adult population, depending on the location of the joints, is 11%, 24% and 43% for OA of the hip, knee joints, and upper extremities, respectively[2]. Among the elderly in developed countries, OA is among the top ten most common causes of disability[3]. Modern non-drug strategies for treating OA are based on nutrition, exercise, and pain relief. The first two strategies intersect with cardiovascular disease (CVD) treatment programs, both of which are related to the patient's loss of mobility.

The mechanisms of relationship between OA and CVD have also not yet been sufficiently studied. In a certain sense, this can be explained by the complexity of organizing and conducting research in patients with different OA phenotypes, different risk factors, and different types of therapy. For example, non-steroidal anti-inflammatory drugs (NSAIDs) commonly used to treat OA can increase the risk of cardiovascular diseases, and reduced physical activity in OA patients can be an additional negative factor for patients with cardiovascular diseases. It should be taken into account that over the past 30 years, ideas about osteoarthritis, the nature of changes occurring in the joint, have changed. Currently, OA is considered not only as a disease affecting the cartilage of large joints (the concept of the 90s), not only as a disease affecting a joint as a whole organ (the concept of the first decade of the 21st century), but also as a disease of the entire organism with a low level of systemic inflammation. It should be noted that weakly expressed systemic inflammation, in addition to OA, is also characteristic of cardiovascular diseases and diabetes mellitus. For example, in DM, hyperglycemia can lead to joint damage, cartilage degradation [4], and the development and progression of atherosclerosis [5]. Thus, when planning and conducting treatment for patients with OA and CVD, it is necessary to consider the presence of systemic inflammation. Currently, the available data is insufficient to suggest a direct link between OA and mortality from all causes.

Nevertheless, there are connections between OA of some joints (hip, knee, and hand) and mortality from all causes [6][7]. The most convincing data are associated with an increased risk of death from OA and cardiovascular diseases [6][7]. The prevalence of concomitant diseases among individuals with OA was 54.6% for one or more of the eight concomitant chronic diseases and 22.2% for two or more concomitant chronic conditions with OA. In the 65+ age group, the prevalence of one or more concomitant chronic conditions was 33.2%, and the prevalence of two or more concomitant chronic conditions with OA was 19.0%.

The prevalence of one or more comorbidities among individuals with musculoskeletal disorders is twice as high as among individuals without musculoskeletal disorders but with other chronic diseases [8]. Today, it is known that osteoarthritis and cardiovascular diseases are the most common condition in people in developed countries, contributing to the global burden on healthcare worldwide due to pain, disability, job loss, and treatment costs [9-12]. The number of comorbidities is associated with limited activity, pain, and poor well-being [13][14]. Thus, about 40% of patients with OA suffer from cardiovascular diseases associated with impaired physical activity [15].

METHODS

Our study included 30 patients with hypertension and osteoarthritis who received basic anti-inflammatory therapy, as well as 30 patients with hypertension without osteoarthritis who did not receive basic anti-inflammatory therapy. The diagnosis of OA was made based on patient complaints, medical history, objective examination results, and laboratory instrumental studies of the American Society for Osteoarthritis, the European League for Osteoarthritis Control (ACR/EULAR 2019), and diagnostic criteria. The diagnosis of hypertension was made based on patients' complaints, medical history, objective examination results and laboratory instrumental studies, diagnostic criteria of the European Society of Cardiologists and the European Society of Hypertension (ESC/ESH 2018).

Table 1.

General characteristics of patients by groups.

Indicator	**Main group (with OA) (n=30)**	**Control group (no OA) (n=30)**
Age, year	62,6±1,27	62,9±1,68
Gender, female/male	16/14	15/15
Body mass index, kg/m2	31,7±0,83	30,29±0,86
Obesity, n (%)	21(70%)*	15(50%)
Type 2 diabetes mellitus, n (%)	10 (33,4%)*	6 (20%)
Duration of hypertensive disease, years	9,1±0,61	9,8±0,64
Smokers, n (%)	9(30%)*	5(16,7%)
Drinkers, n (%)	6(20%)	4(13,3%)
Chronic kidney disease, n (%)	9 (22,5%)	29 (72,5%)

The main group consisted of 30 patients with GB and OA who received basic anti-inflammatory therapy (21 women (70%) and 9 men (30%); average age was 64.5±1.51 years), the control group consisted of 30 patients with GB and OA (10 women (33.3%) and 20 men (66.7%); average age was 61.03±1.4 years).

Table 2.

Results of the examination of patients' general blood tests.

Indicators Hemoglobin (g/l)	**Main group (n=30)**		**Control group (n=30)**		P
	M	**m**	**M**	**M**	
Erythrocytes, (x 1012 /l)	107,6	1,9	113,6	2,6	<0,05
Color indicator	4,1	0,1	4,5	0,24	>0,05
Leukocytes, (x 109/L)	0,82	0,007	0,81	0,007	>0,05

Platelets, (x 109/L)	8.6	0,34	6,8	0,35	<0,01
ESR, mm/s	260.8	6.9	232,6	11,2	<0,05
C Reactive protein	23.9	1,2	11,9	0,74	<0,01

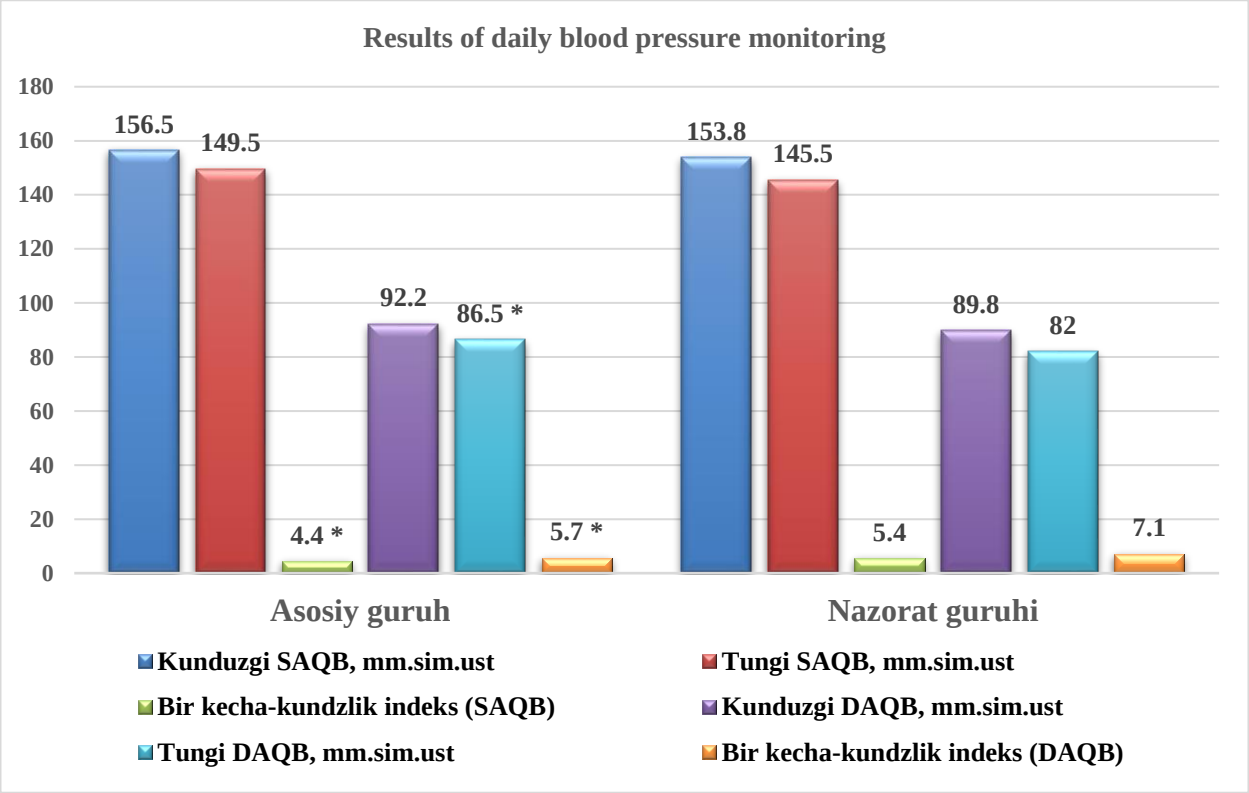

Figure 1. Results of daily monitoring of patients' blood pressure.

According to the results of daily monitoring of peripheral blood pressure, the average daily, daytime, nighttime, and daily systolic blood pressure in patients of the main group was 156.5±3.2; 149.±2.8 and 4.4±0.3 mm Hg, respectively. In patients of the control group, these indicators were 153.8±3.0; 145.5±2.7 and 5.4±0.4 mmHg, which was lower than in the main group ($p<0.05$). Also, the average daily, night, and daily diastolic blood pressure in patients of the main group was 92.2±1.9; 86.5±1.7 and 5.7±0.4 mmHg, and in patients of the control group, respectively, 89.8±1.8; 82.0±1.6 and 7.1±0.5 mm Hg, respectively. This indicator was also higher in patients of the main group compared to the control group ($p<0.05$; Figure 1).

RESULTS

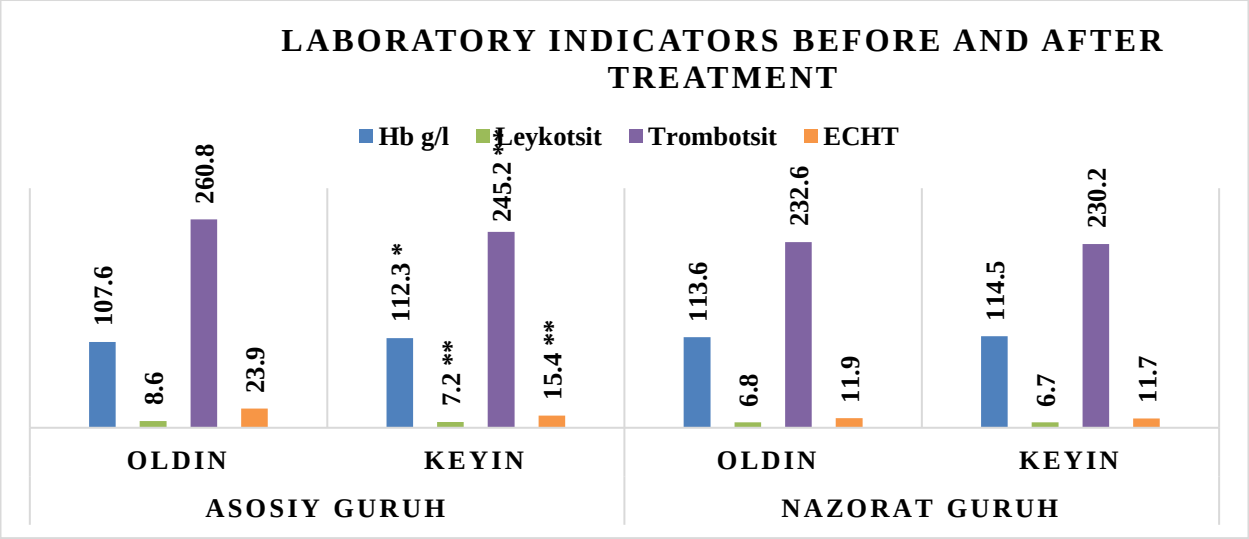

Figure 2. Comparative analysis of the indicators in patients before and after treatment.

When comparing the results of the general blood test of patients before and after treatment, hemoglobin in the main group of patients significantly differed from 107.6 to 112.3 ($p<0.05$). Leukocytes, platelets, and ESR in patients of the main group decreased from 8.6 to 7.2, from 260.8 to 245.2, and from 23.9 to 15.4 respectively compared to pre-treatment indicators ($p<0.01$). In the control group, no significant changes in the above indicators were observed ($p>0.05$; Figure 1).

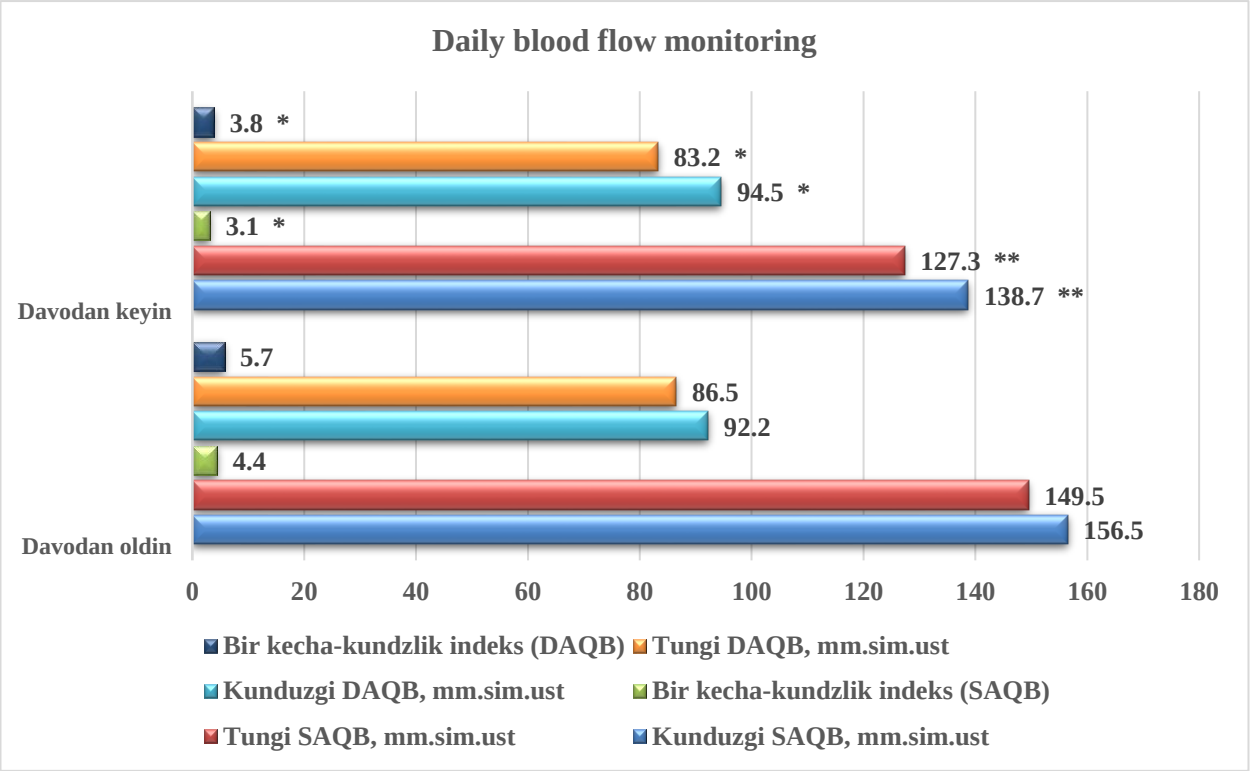

Figure 3. Daily monitoring of blood pressure in patients of the main group before and after treatment.

Based on the results of daily monitoring of patients, late blood pressure types were studied. The study results showed that the dipper type increased in the main group before and after treatment ($P<0.05$; Figure 3.5). This change in the scientific literature is explained by a decrease in the influence of the number of inflammatory cytokines COG-2, prostaglandins, and interleukins on hemodynamic parameters and glomerular filtration-reabsorption rate at night

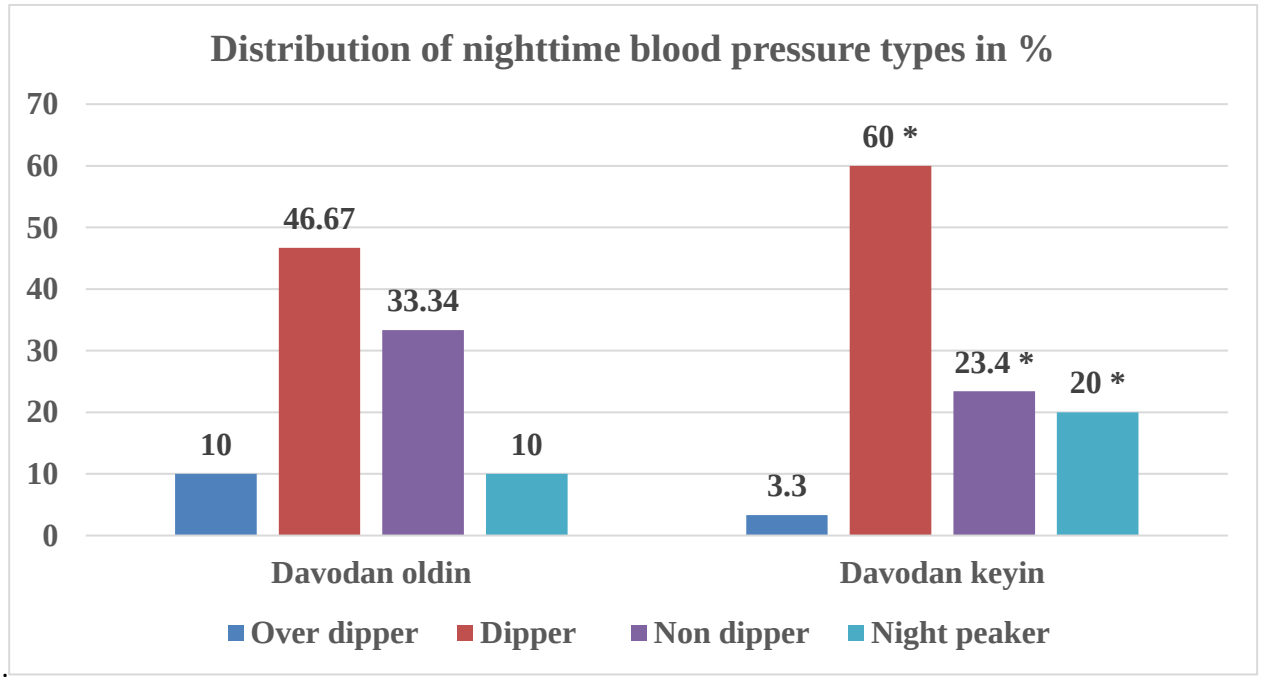

Figure 3. Comparative analysis of changes in nighttime blood pressure before and after treatment in daily monitoring.

DISCUSSION

In our retrospective studies, the frequency of GB occurrence in hospitalized patients diagnosed with OA was 34.8%. However, it should be remembered that daily blood pressure monitoring in these patients was not conducted, and therefore, hidden arterial hypertension was not detected [62]. According to the results of the conducted studies, in 35-41% of OA patients, the diagnosis of GB was made only as a result of additional studies. Considering that patients in this group often use primary and secondary medical services, it is difficult to explain this situation. Overall, the results obtained in our study are consistent with the data presented in the literature, which once again confirms the high level of AH in OA and the relevance of this problem. In our study, in patients receiving meloxikam, blood pressure increased significantly after treatment, and the proportion of "non-dipper" or extreme categories (over-dipper, night peaker) in 24-hour blood pressure monitoring was higher than in the control group. According to our research results, in the main group, the proportion of over dipper increased from 10% to 3.3% after treatment, dipper type from 46.67% to 60%, non dipper type from 33.3% to 16.7%, and night peaker type from 10% to 20% ($P<0.05$). In the control group, these indicators decreased from 13.33% to 10%, from 43.33% to 46.67%, from 30% to 33.33%, and from 13.33% to 10% respectively ($P>0.05$). These results indicate that meloxicam can relatively worsen blood pressure in patients with hypertension and lead to the formation of latent hypertension.

CONCLUSION.

1. When studying risk factors in patients, it was established that hypertension and osteoarthritis are more associated with hypodynamia, bad habits, obesity, and type 2 diabetes, and risk factors are close to each other;

2. In AH patients with osteoarthritis, the levels of C-reactive protein, platelets, total cholesterol, and low-density lipoproteins, as well as the atherogenicity index, were significantly higher than in patients without osteoarthritis ($P<0.05$). This indicates that in combination with OA, the risk of atherosclerosis is higher;

3. In hypertensive disease with osteoarthritis, the effectiveness of antihypertensive therapy is relatively lower than without it, and the frequency of arterial pressure types having unfavorable prognostic value is higher. There is a positive correlation between blood pressure and the daily index and factors associated with osteoarthritis ($P<0.05$).

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