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EVALUATION OF 24-HOUR CHANGES IN BLOOD PRESSURE AND RHYTHM DISTURBANCES IN PATIENTS WITH ARTERIAL HYPERTENSION UNDER THE INFLUENCE OF VARIOUS FACTORS

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Abstract

Relevance. Arterial hypertension is one of the main risk factors for cardiovascular diseases and can be accompanied by disturbances in the daily rhythm of arterial blood pressure and heart rhythm. The integrated use of 24-hour arterial pressure monitoring (SABM) and Holter electrocardiographic monitoring allows for a combined assessment of arterial pressure dynamics and changes in cardiac rhythm.

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Purpose. Assessment of the daily arterial blood pressure profile and cardiac rhythm disturbances in patients with arterial hypertension using SABM and Holter monitoring.

Research design and materials. The study included 60 patients undergoing treatment in the cardiology department of the TSUL Multidisciplinary Clinic. The results of a comprehensive examination of 60 patients diagnosed with arterial hypertension (AH) were analyzed: daily blood pressure monitoring, Holter-ECG monitoring, lipid spectrum, coagulogram, and blood biochemical analysis indicators. The mean age of the patients was 54.4±11.3 years. Of these, 13 (21.7%) were men and 47 (78.3%) were women. Based on the SABM results, the daily blood pressure profile was assessed according to the dipper, non-dipper, night-piker, and over-dipper types. In Holter monitoring, the migration of supraventricular and ventricular extrasystoles and rhythm regulators was analyzed.

Results. According to the SABM results, out of 60 patients, 21 (35.0%) had a dipper, 28 (46.6%) had a non-dipper, 10 (16%) had a night-piker, and 1 (1.7%) had an over-dipper. Holter monitoring revealed supraventricular extrasystole in 49 (81.7%) patients, ventricular extrasystole in 38 (63.3%), the combination of supraventricular and ventricular extrasystole in 30 (50%), sinus tachycardia in 11 (18.3%), paroxysmal supraventricular tachycardia in 4 (6.4%), atrial fibrillation in 1 (1.7%), and rhythm regulator migration in 1 (1.7%). A moderate increase in LDL levels (4.08±0.70 mmol/L) was observed in the lipid profile. The results obtained confirm the need for a comprehensive assessment of cardiovascular risk and the development of an individualized treatment strategy in the group of patients with hypertension.

Conclusion. In patients with arterial hypertension, disturbances in the daily arterial blood pressure profile were observed, especially with a high frequency of non-dipper type and various cardiac rhythm disturbances. The comprehensive use of SABM and Holter monitoring provides an important diagnostic opportunity

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for the combined assessment of daily blood pressure dynamics and cardiac rhythm disorders.

Keywords: Arterial hypertension, SABM, and daily blood pressure profile, Holter monitoring, cardiac arrhythmia.

Relevance

Cardiovascular diseases remain the leading cause of death and disability worldwide, with hypertension playing a special role. In recent years, 24-hour arterial pressure monitoring has been recommended as the most reliable method for diagnosing hypertension and assessing cardiovascular risk, as it allows for the assessment of the circadian rhythm of pressure—including the degree of decrease in nighttime pressure compared to daytime levels. Insufficient nighttime pressure drops (the "non-dipper" type) and high nighttime pressure (the "night-piker") are currently considered independent prognostic factors for the risk of cardiovascular complications and overall mortality [1].

Long-term ECG monitoring using the Holter method is the primary method that allows for determining the frequency and nature of cardiac rhythm disturbances, as well as assessing their clinical significance—especially against the background of hypertension-related cardiac structural changes (left ventricular hypertrophy). It has been shown that the high frequency of arrhythmias may be associated with the risk of developing cardiovascular complications in the future [2].

Lipid metabolism disorders, specifically elevated LDL cholesterol levels, are recognized as the primary variable factor in the pathogenesis of atherosclerotic cardiovascular diseases, and a direct linear relationship has been demonstrated between its level and the frequency of cardiovascular events [3, 4].

Elevated plasma fibrinogen levels are also considered one of the factors involved in the development of atherothrombosis and may be associated with a risk of cardiovascular complications against the background of hypertension [5].

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In this regard, a comprehensive analysis of SABM, Holter-ECG, and laboratory parameters in the group of patients diagnosed with hypertension is of practical and scientific importance.

Currently, arterial hypertension is one of the most common cardiovascular pathologies, affecting approximately 30–47% of the adult population in various regions of the world, with the age-related prevalence of the disease and insufficient levels of control indicated as a separate problem [6, 10]. In the 2023 recommendations of the European Society for Hypertension (ESH), 24-hour blood pressure monitoring is defined as the gold standard for diagnosing and monitoring the effectiveness of hypertension treatment, and nighttime blood pressure indicators and circadian rhythm are considered separate prognostic factors.

The link between obesity and arterial hypertension is realized through multifaceted pathophysiological mechanisms: an increase in visceral adipose tissue increases the activity of the sympathetic nervous system and the renin-angiotensin-aldosterone system, increases sodium reabsorption in the kidneys, and as a result, leads to chronic hypertension. It has been shown that these mechanisms increase the risk of primary arterial hypertension against the background of obesity by 65-75% [7].Among lipid spectrum indicators, low HDL cholesterol levels are also considered an independent atherogenic risk factor: HDL is involved in the reverse transport of cholesterol and the anti-inflammatory protection of the vascular wall; however, recent studies have shown that its atheroprotective effect depends not only on its quantitative level but also on its functional quality [8]. The relationship between heart and renal function is described through the concept of "cardiorenal syndrome," where it is shown that hemodynamic changes in the cardiovascular system negatively affect renal perfusion and filtration function, and conversely, a decrease in renal function (manifested by an increase in creatinine levels) can increase the risk of cardiovascular complications [9]. Therefore, regular monitoring of renal function

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indicators, such as creatinine and urea, in patients with hypertension is of clinical importance.

The aforementioned data indicate that the assessment of cardiovascular risk in patients with hypertension should be conducted comprehensively across several interrelated areas: circulatory blood pressure profile, rhythm disturbances, lipid profile, body mass index, and renal function, which constitutes the methodological basis of this study.

• Coagulogram - fibrinogen, prothrombin index (PTI), and international normalized ratio indicators were measured.

• Biochemical blood analysis - glucose, urea, and creatinine levels were determined.

• Body mass index (BMI) - calculated in kg/m2 based on the patient's weight and height.

• Risk factors (hereditary predisposition, harmful habits, physical inactivity, comorbid conditions) were identified in patients.

Research results

The average age of the 60 examined patients was 54.4±11.3 years. The mean body mass index of the patients was 30.40±1.92 kg/m2, which corresponds to the average grade I obesity threshold for the group. Among the risk factors, the most common were hereditary predisposition to cardiovascular diseases (54.0%), obesity (66.7%), dyslipidemia (96.7%), a sedentary lifestyle (59.0%), and chronic stress (52.0%), while a harmful habit (smoking) was noted in 15.0% of patients (69.2% among men). Among comorbid conditions, coronary heart disease (58.3%) and type 2 diabetes mellitus (26.7%) were observed, while cerebrovascular disease was not identified in any patient. All test results are summarized in Table 1.

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Table 1 Description of examined patients

Indicator Result, n (%) or M ± SD	n (%) or M ± SD
Demography	
Age, years	54.4±11.3
Women, n (%)	47 (78.3%).
Men, n (%)	13 (21.7%).
Body mass index (BMI), kg/m2	30.40 ± 1.92;
Risk factors	
Hereditary predisposition (according to STD), n (%)	32 (54.0%).
Obesity (BMI ≥30 kg/m2), n (%)	40 (66.7%).
Dyslipidemia†, n (%)	58 (96.7%).
Harmful habit (smoking), n (%)	9 (15.0%).
Low mobility, n (%)	35 (59.0%).
Chronic stress, n (%)	31 (52.0%).
Comorbidity	
Ischemic heart disease (IHD), n (%)	35 (58.3%).
Type 2 diabetes mellitus, n (%)	16 (26.7%).
Diagnostic categories	
Stage II hypertensive disease (HD), n (%)	26 (43.3%).
Stage III hypertensive disease (HD), n (%)	33 (55.0%).
Arterial hypertension (AH) grade I, n (%)	8 (13.3%)
Arterial hypertension (AH) grade II, n (%)	46 (76.7%).
Daily Blood Pressure Monitoring (BPM) - Circadian Type	
Dipper, n (%)	21 (35.0%).
Non-dipper, n (%)	28 (46.6%).
Night Picker n (%)	10 (16%)
Over-dipper, n (%)	1 (1.7%).
Holter ECG monitoring	
Supraventricular extrasystole (SVE), n (%)	49 (81.7%)
Ventricular extrasystole (VES), n (%)	38 (63.3%)
CVES and VES were recorded together, n (%)	30 (50.0%).

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Sinus tachycardia (ST), n (%)	11 (18.3%).
Atrial fibrillation, n (%)	1 (1.7%).
Migration of the rhythm guide, n (%)	1 (1.7%)
Lipid spectrum	
Total cholesterol (TCH), mmol/L	5.25 ± 0.69
HDL cholesterol, mmol/L	1.00 ± 0.10
LDL cholesterol, mmol/L	4.08 ± 0.70
HDL cholesterol *, mmol/L	0.91 ± 0.28
Coagulogram	
Fibrinogen, mg/dL 354.95 ± 20.02	354.95 ± 20.02
Prothrombin index (PTI), % 94.08 ± 14.33	94.08 ± 14.33
XNN, units 1.02 ± 0.10	1.02 ± 0.10
Biochemical blood test	
Glucose, mmol/L	5.86 ± 1.32
Urea, mmol/L	6.10 ± 1.34
Creatinine, μmol/L	78.42 ± 15.56

* - dyslipidemia criterion: presence of at least one of the following indicators: total cholesterol ≥5.2 mmol/L and/or LDL ≥3.0 mmol/L and/or LDL <1.0 mmol/L.

Discussion of results

According to the study results, a non-dipper-type circadian blood pressure profile prevailed in the examined group of patients (46.6%). This indicator aligns with the trend described in the literature: long-term follow-up studies have shown that patients with a non-dipper (especially a stable non-dipper) profile have a significantly higher risk of cardiovascular events compared to the dipper profile [1]. Therefore, it is advisable to individualize antihypertensive therapy in this group of patients, taking into account the nocturnal pressure profile.

Holter-ECG monitoring revealed extrasystole of varying severity in the majority of patients; meanwhile, the combination of VES and CVES was noted in half of

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the patients (50.0%), indicating a multi-level (both ventricular and atrial) nature of the arrhythmogenic process. In isolated cases (1.7%), atrial fibrillation was noted, and in another case (1.7%), migration of the rhythm regulator was noted, indicating the possibility of structural and electrophysiological remodeling of the atrial myocardium against the background of prolonged hypertension. The literature indicates that the prognostic significance of extrasystole depends on its frequency and the presence of structural heart disease, and high-frequency extrasystole can increase the risk of developing cardiovascular complications in the future [2]. This condition can also be explained by the presence of prolonged hypertension and associated left ventricular hypertrophy in the majority of the examined patients.

In the results of the lipid spectrum analysis, the mean LDL cholesterol level (4.08±0.70 mmol/L) was higher than the currently recommended target levels, which indirectly confirms the activity of the atherosclerotic process. In international and regional recommendations on modern lipid management, LDL cholesterol levels are cited as a primary causal factor for atherogenesis, and it is recommended to reduce them to target values depending on the level of cardiovascular risk [3, 4].

Among the coagulogram indicators, the mean fibrinogen level is located in the upper limit of the norm, and the significance of this indicator as a cardiovascular risk factor is specifically emphasized in the literature [5]. Although average creatinine and urea values are within the normal range, elevated creatinine levels in individual patients indicate the need for additional monitoring of renal function in terms of cardiorenal relationships [9].

The average body mass index of the patients (30.40±1.92 kg/m2) is Grade I obesity, which can be pathogenetically associated not only with an independent cardiometabolic risk factor but also with the non-dipper type of hypertension and lipid spectrum disorders—activation of the sympathetic nervous system and the

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renin-angiotensin-aldosterone system against the background of obesity may contribute to insufficient nighttime pressure drops [7].

Overall, the results obtained confirm the need for a comprehensive assessment of cardiovascular risk in patients with hypertension and arterial hypertension based not only on individual indicators (e.g., blood pressure alone or lipid spectrum alone), but also on the combined account of SABM, Holter ECG, lipid spectrum, coagulogram, and renal function indicators, which aligns with the approach put forward in modern international recommendations [6].

Conclusion

In the majority of the 60 examined patients, stage III hypertension (55.0%) and stage II hypertension (76.7%) were combined, indicating the predominance of a severe course of hypertension.

According to the SABM results, a non-dipper-type circadian arterial blood pressure profile was identified in 63.3% of patients, which should be evaluated as an additional factor increasing cardiovascular risk. It is recommended to individually assess the timing of antihypertensive drugs (the possibility of late admission) in patients with a non-dipper type circadian blood pressure profile.

Holter-ECG monitoring revealed extrasystole in the majority of patients (81.7% supraventricular, 63.3% ventricular), and in 50% of patients, both types were combined; the presence of atrial fibrillation and the migration of the conductor rhythm in one case justifies the need for dynamic monitoring of these rhythm disorders. Patients diagnosed with high-frequency or complex forms of extrasystole during Holter ECG monitoring should be monitored dynamically by a cardiologist, and if necessary, additional antiarrhythmic therapy should be considered.

Moderately elevated LDL cholesterol levels in the lipid profile are evaluated as a factor activating the atherosclerotic process, and optimization of hypolipidemic therapy is recommended.

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The results obtained confirm the need for a comprehensive assessment of cardiovascular risk in this patient group based on SABM, Holter-ECG, and laboratory indicators, as well as the development of an individualized treatment and prevention strategy.

The average body mass index of the patients was within the limits of obesity, and evaluating this indicator in combination with blood pressure and lipid profile abnormalities allows for a more accurate stratification of cardiovascular risk.

References

1. Lempiniani P.A., Ylitalo A., Huikuri H., Kesäniemi Y.A., Ukkola O.H. Non-dipping blood pressure pattern is associated with cardiovascular events in a 21-year follow-up study // Journal of Human Hypertension. - 2024. Vol. 38. - P. 444-451.

2. Bjerregaard P., Sørensen K.E., Mølgaard H. Predictive value of ventricular premature beats for subsequent ischemic heart disease in apparently healthy subjects // European Heart Journal. — 1991. Vol. 12. - P. 597-601.

3. Li J.J., Zhao S.P., Zhao D. et al. 2023 Chinese guideline for lipid management // Frontiers in Pharmacology. - 2023.

4. Babić S., Bastać M., Nešović P. Contemporary diagnosis, classification, and treatment of dyslipidemias according to international guidelines 2025–2026 // Journal of the Regional Section of the Serbian Medical Association in Zagreb. — 2026. Vol. 51, No. 1.

5. Canseco-Avila L.M., López-Roblero A., Serrano-Guzmán E. et al. Polymorphisms -455G/A and -148C/T and fibrinogen plasma level as risk markers of coronary disease and major adverse cardiovascular events // BioMed Research International. - 2019. — Article ID 5769514.

6. Mancia G., Kreutz R., Brunström M. et al. 2023 ESH Guidelines for the management of arterial hypertension // Journal of Hypertension. - 2023. Vol. 41, No. 12. — P. 1874–2071.

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7. Parvanova A., Reseghetti E., Abbate M., Ruggenenti P. Mechanisms and treatment of obesity-related hypertension - Part 1: Mechanisms // Clinical Kidney Journal. - 2023. Vol. 17, No. 1. - P. 1-18.
8. Vergeer M., Holleboom A.G., Kastelein J.J.P., Kuivenhoven J.A. The HDL hypothesis: does high-density lipoprotein protect from atherosclerosis? // Journal of Lipid Research. - 2020. Vol. 51, No. 8. — P. 2058–2073.
9. Ronco C., House A.A., Haapio M. Cardiorenal syndrome: refining the definition of a complex symbiosis gone wrong // Intensive Care Medicine. - 2008. Vol. 34. - P. 957-962.
10. Ismailova M.A., Khudyakova A.D., Garbuzova E.V., Ragino Yu.I. Arterial hypertension: the current state of the problem in Russia and the world. Review of literature. Part I // Arterial hypertension. - 2024. — Vol. 30, 3. No — P. 238-247.