UDC 616.12-008.331.1-06:616.12-005.4:616.12-008.318.4:612.12:577.112.2
DOI: http://doi.org/10.31928/2664-4479-2026.1.5059

Concentration of galectin-3 in blood plasma in patients with stage III hypertension and its changes in the presence of comorbid chronic coronary disease and frequent ventricular extrasystole

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The aim of the work – to investigate the content of galectin-3 in blood plasma in patients with hypertension stage III and its changes in the presence of comorbid chronic coronary artery disease and frequent ventricular extrasystole.

Materials and methods. We examined 120 people, including 34 (28.3 %) women and 86 (71.7 %) men, with an average age of 57.3±0.9 years, with hypertension (HD) stage III with/without comorbidity of chronic coronary disease (CHD) and frequent ventricular extrasystole (VE). All patients undergone echocardiography, Holter monitoring of electrocardiograms, stress tests and/or coronary ventriculography. Considering the presence or absence of comorbid CHD and frequent VE, four groups of patients were identified: 1st (n=30) – patients with HD without concomitant CHD and VE, 2nd (n=30) – patients with HD and frequent VE, 3rd (n=30) – patients with HD and concomitant CHD, 4th (n=30) – patients with HD and concomitant CHD and frequent VE. The content of galectin-3 in EDTA blood plasma was determined by immunoenzymatic method using a commercial kit «Human GAL3 (Galectin 3) ELISA Kit» («Elabscience iotechnology Inc.», USA). Statistical analysis of the study results was performed using methods of variational statistics with Microsoft Excel (2019) and Statistica 12.0 (Statsoft, USA).

Results. It was determined that in patients with HD stage III with and without concomitant CHD and frequent VE (n=120), the mean plasma galectin-3 level was 2.54±1.12 ng/ml (median value – 2.47; interquartile range – 1.67 and 3.27 ng/ml). The rounded median value of the indicator was used to identify uniform groups with relatively low and relatively high galectin-3 content (hereinafter referred to as RLC and RHC, respectively). The RLC of galectin-3 for the examined sample was ≤ 2.5 and the RHC was > 2.5 ng/ml, respectively. Significantly higher plasma galectin-3 levels (3.41 ng/mL) were found in the group with HD and concomitant CHD and VE, and the lowest (1.74 ng/mL) in patients with HD without concomitant CHD and VE.

Conclusions. Increased plasma galectin-3 concentration is associated with older age and male gender, the presence of alimentary-constitutional obesity, concomitant CHD and frequent VE, and the use of 3 and 4 antihypertensive drugs compared to 2, and in cases of use of thiazide/thiazide-like diuretics, antiplatelet drugs, and statins.

Key words: galectin-3, hypertension, chronic coronary disease, ventricular extrasystole

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Стаття надійшла: 22.12.2025
Прийнята після рецензування: 20.02.2026
Опублікована: 27.02.2026

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Received: 22.12.2025
Accepted after review: 20.02.2026
Published: 27.02.2026

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Biomarkers are molecules that indicate biological processes and are obtained from peripheral blood. They are used in cardiology to diagnose and evaluate the treatment of cardiovascular diseases (CVD). There are biomarkers that have been extensively studied, such as NT-proBNP or troponins, and others that are newer and have not yet been sufficiently studied, such as galectin-3 [1].

Galectin-3 is involved in the development and progression of many CVDs [2], including hypertensive disease (HD) [3], ischaemic heart disease (IHD) [4], acute cerebrovascular accident [5], myocardial infarction [6], atrial fibrillation [7], myocarditis [8], and heart failure (HF) [9].

Galectin-3 is a pro-inflammatory cytokine associated with atherosclerosis and, accordingly, adverse cardiovascular outcomes [10]. Galectin-3 is expressed by macrophages and participates in the progression of myocardial fibrosis, which is a common autopsy finding in individuals with sudden cardiac death [11].

Anti-galectin-3 therapy may be promising in reducing myocardial fibrosis in CVD and the risk of sudden cardiac death. Clinical studies are investigating the therapeutic efficacy and safety of such therapy [12].

Our study aims to determine the content of galectin-3, its clinical, diagnostic and prognostic significance in patients with HD stage III and its changes in the presence of concomitant chronic coronary artery disease (CHD) and frequent ventricular extrasystole (VE), as well as various clinical indicators.

The aim – to investigate the content of galectin-3 in blood plasma in patients with HD stage III and its changes in the presence of comorbid chronic coronary artery disease and frequent VE, as well as various clinical indicators.

MATERIALS AND METHODS

We examined 120 people, including 34 (28.3 %) women and 86 (71.7 %) men, with an average age of 57.3±0.9 years, with HD stage III with/without comorbidity of CHD and frequent VE.

Table 1 lists the criteria for including patients in the study.

The exclusion criteria for patients in the study were: 1) patients younger than 30 and older than 75 years of age; 2) stage I and II hypertension, symptomatic arterial hypertension; 3) acute forms of coronary artery disease (unstable angina, acute myocardial infarction), previous myocardial infarction, and stable angina pectoris of FC IV; 4) cardiopathies, acute or previous myocarditis, clinically significant congenital and acquired heart defects; 5) second- and third-degree sinoatrial and atrioventricular block, left bundle branch block, implanted or requiring implantation of an artificial pacemaker; 6) paroxysmal, persistent, and permanent forms of AF/atrial flutter, paroxysmal supraventricular tachycardia; 7) chronic HF stages A, B, and D according to the Heart Failure Society of America, with an ejection fraction < 50 % according to echocardiography; 8) diabetes mellitus, severe and clinically significant comorbid conditions with organ dysfunction (including end-stage chronic kidney disease), mental disorders, and alcohol abuse; 9) lack of informed consent and unwillingness of the patient to participate in the study.

Table 1
Criteria for including patients in the study

No.	Clinical criteria
1	Patients aged 30 to 75 years
2	Stage III HD
3	Concomitant CHD (optional inclusion criterion), which included only one clinical variant – exertional angina pectoris II–III FC
4	Symptomatic frequent VE (optional inclusion criterion) (> 30 episodes of extrasystole per hour of study)
5	Stage C of HF according to the Heart Failure Society of America, with preserved ejection fraction (> 50 % according to echocardiography), II–III FC according to the New York Heart Association (NYHA), and stage 1 according to M.D. Strazhesko and V.H. Vasilenko
6	Glomerular filtration rate ≥30 ml/min/1.73 ml
7	Informed consent of the patient to participate in the study

HD – hypertension; CHD – chronic coronary disease; FC – functional class; HF – heart failure; VE – ventricular extrasystole.

HD stage III was determined according to the recommendations of the European Society of Hypertension, 2023 [13], as well as the Clinical Protocol for Primary and Specialised Medical Care for Patients with HD, 2024 [14]. Comorbid CHD (optional inclusion criterion) was diagnosed instrumentally using stress tests and/or coronary ventriculography and included only exertional angina of functional classes (FC) II–III according to the recommendations of the European Society of Cardiology, 2024 [15] and the unified clinical protocol 'Stable ischaemic heart disease' (Order of the Ministry of Health of Ukraine No. 265 of 16 February 2021) [16]. All patients were diagnosed with arrhythmias using Holter electrocardiogram monitoring (Guideline 00051. Outpatient ECG monitoring) [17]. The study included patients with stages C of HF according to the Heart Failure Society of America, with preserved ejection fraction (> 50 % according to echocardiography) (Recommendations of the ESC, 2023 [18] and the All-

Table 2
Types of antihypertensive therapy prior to patient enrollment in the study

Group of drugs No.	Number of patients (%), n=120
ACE inhibitors	82 (68.3 %)
Angiotensin II receptor blockers	38 (31.7 %)
Beta-blockers	68 (56.7 %)
Thiazide/thiazide-like diuretics	100 (83.3 %)
Lopside diuretics	2 (1.7 %)
Mineralocorticoid receptor antagonists	5 (4.2 %)
Calcium channel blockers	73 (60.8 %)
Antithrombotic drugs	101 (84.2 %)
Statins	98 (81.7 %)

Ukrainian Association of Cardiologists of Ukraine on the diagnosis, treatment and prevention of chronic heart failure, 2024 [19]).

The duration of medical history was as follows: HD – 8.6±6.0, CHD – 4.8±2.6, arrhythmology – 3.5±3.0 years, respectively.

Considering the presence or absence of comorbid CHD and frequent VE, four groups of patients were identified: 1st (n=30) – patients with HD without concomitant CHD and VE, 2nd (n=30) – patients with HD and frequent VE, 3rd (n=30) – patients with HD and concomitant CHD, 4th (n=30) – patients with HD and concomitant CHD and frequent VE.

Table 2 lists the drugs that the examined patients received for antihypertensive purposes.

At the outpatient stage, 34 (56.7 %) patients with VE used various beta-blockers (nebiolol, carvedilol, betaxolol, bisoprolol) for antiarrhythmic purposes, 22 (36.7 %) patients received propafenone (150–600 mg per day), 8 (13.3 %) received etatsizin (50–150 mg per day), and 4 (10.0 %) received amiodarone (200–600 mg per day). It should be noted that antiarrhythmic drugs were used according to different regimens (both as continuous therapy and as needed therapy). In addition, 8 (13.3 %) patients with VE used a combination of beta-blockers and propafenone for antiarrhythmic purposes, and only 2 (3.3 %) patients used a combination of beta-blockers and etatsizin.

The content of galectin-3 in EDTA blood plasma was determined by immunoenzymatic method using a commercial kit «Human GAL3 (Galectin 3) ELISA Kit» («Elabscience Biotechnology Inc.», USA) in accordance with the manufacturer's instructions. The coefficient of variation was < 10 %, the analytical sensitivity of the method was 0.1 ng/ml galectin-3, and the detection range was 0.16–10 ng/ml galectin-3.

Statistical analysis of the study results was performed using methods of variational statistics with Microsoft Excel (2019) and Statistica 12.0 (Statsoft, USA). Values are presented as n (%) – absolute number (percentage) and M±σ – mean value ± standard deviation of the mean. Given the large number of comparisons, the results are descriptive in nature; C.E. Bonferroni correction was not applied (due to the exploratory nature of the study). The intergroup reliability of the results was calculated using variance analysis – one-way ANOVA and LSD test (4 groups of 30 people) and between quantitative values was calculated using the t-test (2 groups of 60 people), between relative values (%) – using the χ^2 criterion for independent samples. Using the method of variational statistics, it was determined that the content of galectin-3 in plasma in the general cohort of patients (n=120) was within the range of 0.38–5.37 (mean value – 2.54±1.12 ng/ml). According to the W-test, the Shapiro – Wilk criterion was calculated (W=0.99, p=0.31), confirming the normal distribution of galectin-3 values in the total sample. Confirmation of the hypothesis of normal distribution also necessitated the use of parametric methods of statistical analysis in relation to this indicator and the presentation of its value as the mean (M) and σ – standard deviation from the mean (M±σ). The median of the indicator was 2.47 (rounded value – 2.5), the interquartile range – 1.67 and 3.27 ng/ml, respectively. The rounded median value of the indicator was used to identify uniform groups with relatively low and relatively high galectin-3 content (hereinafter referred to as RLC and RHC, respectively). Thus, the RLC of galectin-3 for the examined sample was ≤ 2.5 and the RHC was > 2.5 ng/ml, respectively.

The research protocol was developed in accordance with the ethical standards of the 1975 Helsinki Declaration and its 1983 revision and was approved by the local ethics committee of the M.I. Pirogov Vinnitsa National Medical University (Protocol No. 8 of 5 October 2017).

RESULTS AND DISCUSSION

Variation statistics were used to determine that the plasma galectin-3 content in the total cohort of patients (n=120) ranged from 0.38 to 5.37 (mean value – 2.54±1.12 ng/ml). According to the W-test, the calculated criterion Shapiro – Wilk (W=0.99, p=0.31), which confirms the normal distribution of galectin-3 values in the total sample. Confirmation of the hypothesis of normal distribution also necessitated the use of parametric methods of statistical analysis in relation to this indicator and the presentation of its value as the mean

(M) and σ – standard deviation from the mean (M±σ). The median of the indicator was 2.47 (rounded value – 2.5), interquartile range – 1.67 and 3.27 ng/ml, respectively. The rounded median value of the indicator was used to identify uniform groups with relatively low and relatively high galectin-3 content (hereinafter referred to as RLC and RHC, respectively). Thus, the RLC of galectin-3 for the examined sample was ≤ 2.5 and the RHC was > 2.5 ng/ml, respectively.

The results of the study show that in 50 % of patients, the plasma galectin-3 content was within the range of 1.67–3.27 ng/ml, in 25 % of patients it was below 1.67 ng/ml, while in the remaining 25 % it exceeded 3.27 ng/ml.

Analysis of galectin-3 level variation in different clinical groups *(Figure 1)* shows that its plasma content increased from group to group and reached its maximum value in the 4th clinical group. A significant increase in galectin-3 content in plasma was observed in patients in the 3rd and 4th groups compared to the 1st group (2.72 and 3.41 vs. 1.74 ng/ml, p=0.0008 and 0.0001, respectively), and in patients in the 4th group compared to the 2nd and 3rd groups (3.41 vs. 2.30 and 2.72 ng/ml, p=0.0002 and 0.03, respectively). Thus, the highest concentration of galectin-3 in plasma (3.41 ng/ml) was found in patients with HD and concomitant CHD and frequent VE, while the lowest (1.74 ng/ml) was found in patients with HD. This pattern is also confirmed by further analysis, the results of which are shown in *Figure 2*.

Figure 2 shows that RLC of galectin-3 (≤ 2.5 ng/ml) was significantly more common in group 1, which is statistically significant in relation to all other groups (83.3 % vs. 50.0 %, 46.7 % and 26.7 %, p=0.006, 0.003 and <0.0001, respectively). In addition, in the second group, compared with the fourth group, a higher percentage of cases with RLC marker levels was recorded, which tended to be statistically significant (50.0 % vs. 26.7 %, p=0.06).

The results of the study indicate that in patients with HD in the absence of concomitant CHD and frequent VE, a level of galectin-3 ≤ 2.5 ng/ml is determined significantly more often compared to other groups.

One study has determined that galectin-3 levels in blood serum were higher in patients with CHD compared to patients without CHD (9.07±3.76 ng/ml versus 5.65±1.69 ng/ml, p<0.001) [3]. Serum galectin-3 levels were also significantly higher in the group of patients with IHD than in the group without IHD (3.89 (0.16–63.67) vs. 2.07 (0.23–9.38) ng/ml, p<0.001) [20].

Elevated levels of gal-3 activate fibroblasts and exacerbate myocardial fibrosis, which contributes to the development of ventricular arrhythmias, including unstable ventricular tachycardia. Thus, in patients with HF of both ischemic and non-ischemic origin who underwent implantation of a cardioverter-defibrillator, an increase in galectin-3 concentration predicted the development of further ventricular arrhythmias re-

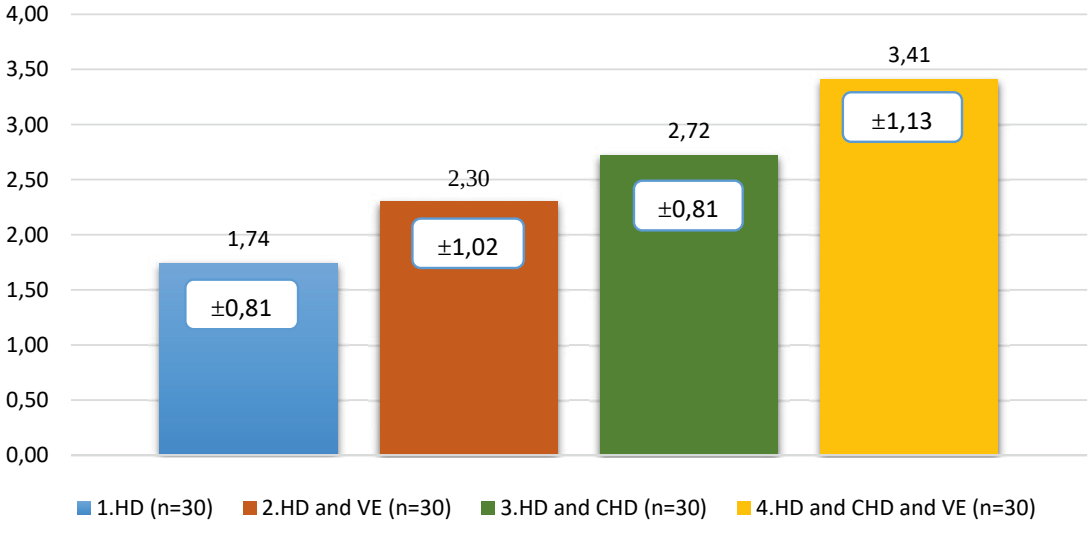

Figure 1. **Variations in galectin-3 content (in ng/ml) in patients from different clinical groups (represented by M±σ). Intergroup reliability of results was calculated using one-way ANOVA and LSD test: p_{1-2}=0.11; p_{1-3}=0.0008; p_{1-4}=0.0001; p_{2-3}=0.32; p_{2-4}=0.0002; p_{3-4}=0.03. HD – hypertension; CHD – chronic coronary disease; VE – ventricular extrasystole.**

gardless of the presence of previous ventricular arrhythmias in the medical history [21].

In a study by E. Moric-Janiszewska et al. [22], the level of galectin-3 in children with idiopathic supraventricular and ventricular arrhythmias did not differ from that in healthy children. No correlation was found between the concentration of galectin-3 and the age and sex of the children examined. A study by R. Pietrzak et al. [23] showed that adolescents with ventricular arrhythmias had higher galectin-3 levels than their healthy peers.

Table 3 shows the analysis of the dependence of galectin-3 levels on various clinical characteristics. It was observed that in young patients, the average marker content was significantly lower compared to middle-aged patients (1.99 vs. 2.70 ng/mL, p=0.03) and slightly lower (with a tendency toward significance) compared to elderly patients (1.99 vs. 2.55 ng/mL, p=0.09). At the same time, a significantly higher galectin-3 content was determined in men compared to women (2.68 vs. 2.20 ng/ml, p=0.03). Therefore, it is reasonable to assume that young age and female gender are associated with lower plasma galectin-3 content.

A correlation between galectin-3 levels in blood plasma and body mass index was also found. It was determined that in patients with constitutional obesity, the marker level is significantly higher compared to patients with normal weight (3.36 vs. 1.35 ng/ml, p<0.0001) and overweight (3.36 vs. 1.84 ng/ml, p<0.0001). At the same time, in patients with excess weight, the galectin-3 content is higher than in patients with normal weight, which tends to be reliable (1.84 vs. 1.35 ng/ml, p=0.06).

The data in *Table 3* show a significantly higher galectin-3 content in groups with comorbid CHD (3.07 vs. 2.02 ng/ml, p<0.0001), in patients with HF and HFSA stage C (2.88 vs. 1.94 ng/ml, p<0.0001) and in patients with frequent VE (3.07 vs. 2.02 ng/ml, p<0.0001).

Somewhat illogical was the higher level of galectin-3 in patients with mild compared to moderate HD (2.84 vs. 2.31 ng/ml, p=0.05) and with a shorter history of arrhythmia (1–5 years compared to > 5 years), although this tended to be statistically significant (3.00 vs. 2.34 ng/ml, p=0.06).

The results regarding the association between galectin-3 levels and the nature of outpatient antihypertensive treatment in the general cohort of patients were unexpected. Thus, the mediator content was higher in patients who used 3 and 4 antihypertensive drugs compared to 2 (2.67 and 2.89 vs. 1.92 ng, p=0.007 and 0.01, respectively). While patients who did not use angiotensin-converting enzyme inhibitors tended to have increased plasma galectin-3 levels, (2.81 vs. 2.42 ng/ml, p=0.08), patients who used sartans did not show any significant difference in hormone levels. (2.83 vs. 2.41 ng/ml, p=0.05). In addition, plasma galectin-3 levels were significantly higher in patients receiving thiazide/thiazide-like diuretics (2.72 vs. 1.73 ng/ml, p=0.0002), antiplatelet drugs (2.65 vs. 1.97 ng/ml, p=0.01) and statins (2.68 vs. 1.96 ng/ml, p=0.006).

Galectin-3 may serve as a marker of statin therapy efficacy in patients with systolic HF of ischemic etiology [24]. According to the CORONA study, low galectin-3 levels (< 19 ng/mL) were associated with high efficacy of rosuvastatin [25].

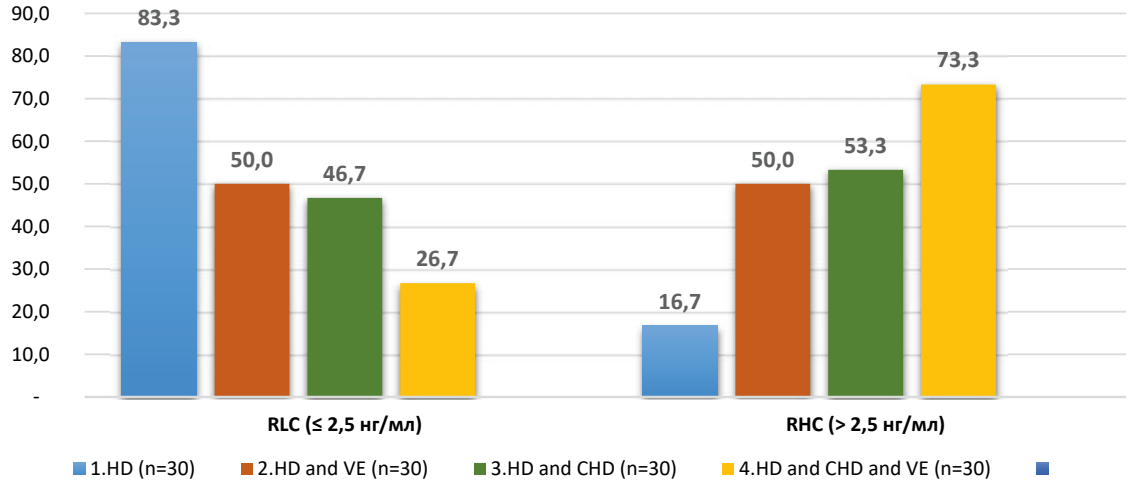

Figure 2. **Distribution of galectin-3 levels in different clinical groups (in %). Intergroup reliability of results was calculated using the χ^2 criterion for independent samples: p_{1-2}=0.006; p_{1-3}=0.003; p_{1-4}<0.0001; p_{2-3}=0.80; p_{2-4}=0.06; p_{3-4}=0.11. RLC and RHC – relatively low and relatively high galectin-3 levels, respectively; HD – hypertension; CHD – chronic heart disease; VE – ventricular extrasystole.**

Table 3
Galectin-3 content (in ng/ml) in the total cohort of patients depending on various clinical indicators

Clinical characteristics	Number of patients	Median (ng/ml)	±σ
Gender			
1. Women	34	2.20	0.94
2. Men	86	2.68	1.16
$p_{t\text{-test}}$		p_{1-2}=0.03	
WHO age classifications			
1. Young age (up to 44 years)	15	1.99	1.01
2. Middle age (45–59 years)	54	2.70	1.15
3. Old age (60–74 years)	51	2.55	1.09
$p_{\text{one-way ANOVA LSD test}}$		p_{1-2}=0.03; p_{1-3}=0.09; p_{2-3}=0.48	
BMI			
1. Normal body weight (BMI 20.0–25.0 kg/m^2)	11	1.35	0.68
2. Overweight (BMI 25.0–30.0 kg/m^2)	50	1.84	0.65
3. Constitutional-alimentary obesity (BMI > 30.0 kg/ml)	59	3.36	0.88
$p_{\text{one-way ANOVA LSD test}}$		p_{1-2}=0.06; p_{1-3}<0.0001; p_{2-3}<0.0001	
Haemodynamic variants of hypertension			
1. Systolic-diastolic hypertension	108	2.56	1.11
2. Isolated systolic hypertension	9	2.59	1.34
3. Isolated diastolic hypertension	3	1.96	1.15
$p_{\text{one-way ANOVA LSD test}}$		p_{1-2}=0.93; p_{1-}3=0.37; p_{2-3}=0.40	
Duration of hypertensive history			
1. Up to 10 years	73	2.50	1.11
2. From 10 to 15 years	29	2.64	1.27
3. More than 15 years	18	2.56	0.98
$p_{\text{one-way ANOVA LSD test}}$		p_{1-}2=0.59; p_{1-3}=0.86; p_{2-3}=1.81	
Duration of arrhythmological history in years			
1. 1-5 years	46	3.00	1.20
2. > 5 years	14	2.34	1.12
$p_{t\text{- test}}$		p_{1-2}=0.06	
Concomitant CHD present/absent			
1. CHD present	60	3.07	1.03
2. CHD absent	60	2.02	0.96
$p_{t\text{-test}}$		p_{1-2}<0.0001	
FC of angina pectoris			
1. FC II	25	3.22	0.87
2. FC III	35	2.95	1.14
$p_{t\text{-test}}$		p_{1-2}=0.32	
Presence of frequent VE			
1. Frequent VE present	60	3.07	1.03
2. Frequent VE absent	60	2.02	0.96
$p_{t\text{- test}}$		p_{1-2}<0.0001	

Table 3. Continued

Option VE			
1. Allorhythmia	12	3.56	1.00
2. Episodic VE	48	3.00	1.03
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.18	
Use of specific classes of antihypertensive drugs			
1. ACE inhibitors were used	82	2.42	1.09
2. No ACE inhibitors were used	38	2.81	1.17
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.08	
1. Sartans were used	38	2.83	1.08
2. No Sartans were used	82	2.41	1.17
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.05	
1. Beta-blockers were used	68	2.62	1.11
2. No Beta-blockers were used	52	2.45	1.14
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.40	
1. Thiazide/thiazide-like diuretics were used	100	2.72	1.08
2. No Thiazide/thiazide-like diuretics were used	20	1.73	0.95
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.0002	
1. CC blockers were used	73	2.51	1.11
2. No CC blockers were used	47	2.59	1.14
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.71	
1. Antiplatelet drugs were used	101	2.65	1.09
2. No Antiplatelet drugs were used	19	1.97	1.13
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.01	
1. Statins were used	98	2.68	1.10
2. No Statins were used	22	1.96	1.04
$p_{t\text{-}test}$		$p_{1\text{-}2}$=0.006	
Number of antihypertensive drugs received by patients at the outpatient stage			
1. 2 drugs	20	1.92	1.11
2. 3 drugs	82	2.67	1.10
3. 4 drugs	13	2.89	1.19
4. > 4 drugs	5	2.14	0.42
$p_{one\text{-}way\ ANOVA\ LSD\ test}$	$p_{1\text{-}2}$=0.007; $p_{1\text{-}3}$=0.01; $p_{1\text{-}4}$=0.89; $p_{2\text{-}3}$=0.49; $p_{2\text{-}4}$=0.32; $p_{3\text{-}4}$=0.22		
The effectiveness of antihypertensive treatment at the outpatient stage			
1. Controlled hypertension	32	2.38	1.23
2. Uncontrolled hypertension	68	2.62	0.99
3. Untreated	20	2.57	1.38
$p_{one\text{-}way\ ANOVA\ LSD\ test}$		$p_{1\text{-}2}$=0.32; $p_{1\text{-}3}$=0.53; $p_{2\text{-}3}$=0.88	

The intergroup reliability of results between quantitative values was calculated using the t-test, between relative values (%) – using the χ^2 criterion for independent samples. BMI – body mass index; HD – hypertension; CHD – chronic coronary disease; FC – functional class; VE – ventricular extrasystole; ACEI – angiotensin-converting enzyme inhibitors; CC – calcium channels.

CONCLUSIONS

It was determined that in patients with HD stage III with and without concomitant CHD and frequent VE (n=120), the mean plasma galectin-3 level was 2.54±1.12 ng/ml (median value – 2.47; interquartile range – 1.67 and 3.27 ng/ml).

It has been proven that a significantly higher content of galectin-3 in plasma (3.41 ng/ml) is determined in the group with HD and concomitant CHD and VE, and the lowest (1.74 ng/ml) – in patients with HD without concomitant CHD and VE.

An increase in plasma galectin-3 concentration is associated with older age and male gender, the presence of alimentary-constitutional obesity, concomitant CHD and frequent VE, when using 3 and 4 antihypertensive drugs compared to 2, when using sartans, thiazide/thiazide-like diuretics, antiplatelet drugs, and statins.

There is no conflict of interest.

Authors' contributions: research concept and design, final approval of the article – V.I.; data collection, article writing – Yu.M.; data analysis and interpretation – Yu.M., V.I.; article editing – O.A.

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Вміст галектину-3 у плазмі крові в пацієнтів із гіпертонічною хворобою III стадії і його зміни за наявності супутніх хронічної коронарної хвороби та частої шлуночкової екстрасистолії

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Мета роботи – дослідити вміст галектину-3 у плазмі крові в пацієнтів із гіпертонічною хворобою (ГХ) III стадії і його зміни за наявності супутніх хронічної коронарної хвороби (ХКХ) та частої шлуночкової екстрасистолії (ШЕ).

Матеріали і методи. Обстежено 120 осіб, з яких 34 (28,3 %) жінки і 86 (71,7 %) чоловіків, середній вік обстежених – (57,3±0,9) року, із ГХ III стадії із супутніми ХКХ та частою ШЕ та без них. Усім пацієнтам проведено ехокардіографію, холтерівське моніторування електрокардіограми, стрес-тести і/або коронаровентрикулографію. З огляду на наявність або відсутність коморбідних ХКХ і частої ШЕ виділено 4 групи пацієнтів: 1-ша (n=30) – пацієнти з ГХ без супутніх ХКХ і ШЕ, 2-га (n=30) – пацієнти з ГХ і частою ШЕ, 3-тя (n=30) – пацієнти з ГХ і супутньою ХКХ, 4-та (n=30) – пацієнти з ГХ і супутніми ХКХ та частою ШЕ. Вміст галектину-3 в ЕДТА-плазмі крові визначали імуноферментним методом з використанням комерційного набору «Human GAL3(Galectin 3) ELISA Kit» (Elabscience Biotechnology Inc., США). Статистичний аналіз результатів дослідження проводили за допомогою методів варіаційної статистики з використанням програми Microsoft Excel (2019) і Statistica 12.0 (Statsoft, США).

Результати. З використанням методу варіаційної статистики визначено, що в пацієнтів із ГХ III стадії з та без супутньої ХКХ і частої ШЕ (n=120) середнє значення галектину-3 в плазмі становить (2,54±1,12) нг/мл (медіана показника – 2,47; інтерквартильний розмах – 1,67 і 3,27 нг/мл). Округлене значення медіани показника використовували для виділення рівномірних груп із відносно низьким і відносно високим вмістом (відповідно ВНВ і ВВВ) галектину-3. ВНВ галектину-3 для обстеженої вибірки становив ≤ 2,5 і ВВВ – > 2,5 нг/мл. Суттєво вищий вміст галектину-3

у плазмі (3,41 нг/мл) виявили у групі із ГХ і супутніми ХКХ і ШЕ та найменший (1,74 нг/мл) – у пацієнтів із ГХ без супутніх ХКХ і ШЕ.

Висновки. Підвищення концентрації галектину-3 у плазмі асоційовано зі старшим віком і чоловічою статтю, наявністю аліментарно-конституційного ожиріння, супутньою ХКХ і частою ШЕ, у разі застосування 3 і 4 порівняно з 2 антигіпертензивними препаратами, у разі застосовування тіазидних/тіазидоподібних діуретиків, антитромбоцитарних препаратів і статинів.

Ключові слова: галектин-3, гіпертонічна хвороба, хронічна коронарна хвороба, шлуночкова екстрасистолія