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Clinical Profile of Autonomic Dysregulation in Functional Cardiopathy and Labile Arterial Hypertension among Male Conscripts

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ABSTRACT

The article examines the prevalence and clinical-functional characteristics of functional cardiopathy (FCP) and labile arterial hypertension (LAH) among male conscripts, with consideration of the structure of adaptive-regulatory mechanisms (ARM). A total of 126 conscripts (18.3 ± 0.6 years) were examined during 2022–2025; 84 individuals formed the main group (presence of FCP/LAH), and 42 served as the comparison group. The study protocol included questionnaires (HADS, PSS-10), physical and laboratory examinations, ECG, echocardiography, 24-hour blood pressure monitoring, and heart rate variability (HRV) analysis. Statistical processing was performed using Student's t-test and χ^2 test, with $p < 0.05$ considered significant. Patients with FCP/LAH demonstrated higher body mass index (24.3 ± 3.9 vs. 22.6 ± 3.1 kg/m²; $p = 0.004$), resting tachycardia (86 ± 9 vs. 75 ± 8 bpm; $p < 0.001$), and elevated office blood pressure (132/82 vs. 119/73 mmHg; $p < 0.001$). The mean 24-hour blood pressure, proportion of "non-dippers," and LF/HF index were significantly higher compared with controls, indicating a predominance of sympathetic imbalance. The findings suggest that the combination of FCP and LAH in one-fifth of conscripts forms a maladaptive phenotype characterized by impaired autonomic regulation, underscoring the need for early detection and targeted preventive interventions.

KEYWORDS: Functional Cardiopathy; Labile Arterial Hypertension; Conscription Age; Heart Rate Variability; Bioacoustic Correction; Adaptive-Regulatory Mechanisms; 24-Hour Blood Pressure Monitoring; Psycho-Emotional Stress.

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INTRODUCTION

Functional cardiopathy (FCP) and labile arterial hypertension (LAH) are two interrelated pathologies that have come to the forefront in the medical screening of males aged 17–21. The World Health Organization (WHO) in 2023 again emphasized that inadequately controlled elevated blood pressure remains a "silent killer," posing a cardiovascular threat from early adulthood, while approximately 80% of hypertensive individuals worldwide do not receive adequate treatment (9). According to Russian and international population studies, the prevalence of elevated blood pressure among adolescents ranges from 4% to 18%, showing a steady increase over the past decade—largely due to obesity, physical inactivity, and psychoemotional stress (5,6). In-depth medical examinations of conscripts reveal that clinically "borderline" blood pressure values often mask latent hypertension: in the group of young men with high-normal blood pressure, 24-hour monitoring detected a latent form of LAH in 25.7% of cases (2,3). Regional screening data from military medical commissions indicate that the proportion of stable hypertension among young men aged 18–27 has doubled over the past decade—from 1.5% in 2002 to 3% in 2011—with a continued upward trend (5). Arterial hypertension is now firmly among the top three causes of limited fitness for military service and early discharge due to cardiovascular diseases.

FCP, belonging to the group of minor anomalies of cardiac development (MARS), is diagnosed in a considerable number of

young men during initial ECG and echocardiographic screening. Specialized information portals for conscripts describe MARS as "a common finding among young men of conscription age" (1,2). Although such findings are often classified as "functional" and do not automatically warrant deferment from service, they reduce tolerance to physical and emotional stress, increase the risk of arrhythmias, and exacerbate the course of LAH. The combination of FCP and LAH forms a maladaptive phenotype with impaired neurovegetative regulation. Under the conditions of military training (daily physical strain, climatic changes, sleep deprivation), this combination can rapidly progress to sustained hypertension, while ECG variants of FCP may evolve into clinically significant arrhythmias (4). These processes lead to an increase in the number of medical examinations and repeated evaluations, higher costs for the Ministry of Defense for additional testing and rehabilitation, elevated risks of non-combat sudden deaths, decreased operational readiness, and the formation of a cohort of young individuals with cardiovascular disability by the age of 30.

Thus, the development of a comprehensive program for the early detection and correction of FCP and LAH in conscripts has high clinical, social, and economic importance. Such a program would improve individual adaptation to military service, reduce long-term cardiovascular risk, and decrease public healthcare expenditures related to the treatment of complications.

Objective. To assess the prevalence and clinical-functional features of functional cardiopathy and labile arterial hypertension in male conscripts, taking into account the structure of their adaptive-regulatory mechanisms.

MATERIAL AND METHODS

Study population. A total of 126 male adolescents of conscription age were examined at the Adolescent Health Center in Tashkent during the period 2022–2025 (mean age 18.3 ± 0.6 years). The participants were divided into two groups: the main group (MG) included 84 adolescents with functional cardiovascular changes, while 42 relatively healthy individuals comprised the comparison group (CG).

Inclusion criteria for MG: "working" systolic blood pressure (SBP) 130–139 mmHg and/or diastolic blood pressure (DBP) 80–89 mmHg on at least two occasions; ECG or echocardiographic signs of FCP (minor anomalies, type I diastolic dysfunction, etc.). Exclusion criteria: congenital heart defects, chronic renal failure, type I diabetes mellitus, or use of antihypertensive drugs for more than three months.

Research methods:

– Anamnesis and physical examination (height, weight, BMI, heart rate, and 24-hour ambulatory blood pressure monitoring).
– Laboratory tests: complete blood count, urinalysis, lipid profile, glucose, and electrolytes (Na^+, K^+, Mg^{2+}). Hormones: TSH, free T_4; in complex cases, cortisol and urinary catecholamines were measured. Cardiac biomarkers (troponin I/T, NT-proBNP) were assessed if myocardial injury was suspected. Vitamin D and ferritin were evaluated as modifiers of autonomic dysfunction.
– Psychophysiological and questionnaire methods: HADS and PSS-10 (Perceived Stress Scale, 10-item version), a standardized questionnaire developed by S. Cohen et al. (1983) to quantify the subjective level of stress experienced during the preceding four weeks.
– Instrumental studies: ECG, heart rate variability (HRV) analysis, echocardiography with Doppler imaging.
– Statistical analysis: data were analyzed using Student's t-test and χ^2 test, with $p < 0.05$ considered statistically significant.

Results of the study

The analysis of anthropometric parameters revealed the following findings. Table 1 presents the results of physical examination and office blood pressure measurements in adolescents of the main group (84 young men with functional cardiovascular abnormalities) and the comparison group (42 practically healthy peers). The mean height was similar between the groups (approximately 174–175 cm, $p = 0.4$). However, body weight in patients with functional pathology was on average 4.7 kg higher, which resulted in a significantly greater body mass index (BMI 24.3 ± 3.9 kg/m² vs. 22.6 ± 3.1 kg/m²; $p = 0.004$). The borderline BMI values observed in the main group emphasize the role of excess body weight as an additional factor contributing to pressure-dependent myocardial load.

Heart rate. At rest, the mean heart rate among adolescents in the main group was 11 beats per minute higher (86 ± 9 vs. 75 ± 8 bpm; $p < 0.001$). This finding correlates well with the previously identified sympathotonic autonomic profile and the increased variability of heart rate changes (ΔHR) observed during the orthostatic test.

Office (working) blood pressure. Systolic blood pressure averaged 132 ± 8 mmHg in the main group versus 119 ± 6 mmHg in the comparison group ($p < 0.001$). Diastolic blood pressure values were 82 ± 6 mmHg versus 73 ± 5 mmHg, respectively ($p < 0.001$).

Table 1. Comparison of anthropometric and hemodynamic parameters in adolescents of the main group and comparison group (M ± σ).

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
Height, cm	174 ± 6	175 ± 5	0.4
Body weight, kg	73.9 ± 10.6	69.2 ± 9.1	0.018
Body mass index, kg/m²	24.3 ± 3.9	22.6 ± 3.1	0.004
Resting heart rate, bpm	86 ± 9	75 ± 8	< 0.001

Office systolic BP, mmHg	132 ± 8	119 ± 6	< 0.001
Office diastolic BP, mmHg	82 ± 6	73 ± 5	< 0.001

These values confirm laboratory-documented labile hypertension: in most young men with functional cardiopathy, office blood pressure falls within the "high-normal" or "borderline" range (≥130/80 mmHg).

Thus, against a background of comparable height, adolescents with FCP and LAH are characterized by higher body weight, resting tachycardia, and significantly elevated office blood pressure. This "portrait-like" distinction underscores the necessity of early correction of body weight and sympathetic overactivity, as well as dynamic blood pressure monitoring to prevent the transition of labile hypertension into a sustained form.

Table 2 presents the distribution of key anamnestic and behavioral risk factors among 84 adolescents with functional cardiovascular abnormalities (main group, MG) and 42 relatively healthy peers (comparison group, CG). One in three participants in the main group (31%) had a first-degree relative who had suffered myocardial infarction or stroke at a young age, while in the control group such cases accounted for only 14% (p = 0.032). This finding highlights the genetic predisposition of adolescents with FCP and LAH to early cardiovascular pathology.

Table 2. Anamnestic data of conscription-age adolescents, n (%)

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
Family history of early cardiovascular events	26 (31.0%)	6 (14.3%)	0.032
Active smoking/vaping	18 (21.4%)	4 (9.5%)	0.087
Consumption of energy drinks ≥ 2 times/week	24 (28.6%)	5 (11.9%)	0.024
Physical inactivity (≤ 2 training sessions/week)	49 (58.3%)	14 (33.3%)	0.006
Sleep < 7 hours/day	46 (54.8%)	11 (26.2%)	0.002

Active smoking/vaping. The frequency was nearly twice as high in the main group (21%) compared to the control group (9.5%), but statistical significance was not reached (p = 0.087). This trend indicates the need for further clarification of the quantity and duration of use to draw definitive conclusions.

Energy drinks ≥ 2 times per week. Almost one-third of adolescents in the main group (28.6%) regularly consumed energy drinks compared to 11.9% in the comparison group (p = 0.024). This significant difference confirms the association between sympathomimetic beverages and labile hypertension.

Physical inactivity (≤ 2 training sessions per week). A sedentary lifestyle was observed in 58.3% of young men with functional cardiovascular abnormalities and only 33.3% of their healthy peers (p = 0.006). This factor amplifies the effects of obesity and reduces heart rate variability.

Sleep duration < 7 hours. Insufficient sleep was found in half of the main group (54.8%) and only one-fourth of the comparison group (26.2%), with a highly significant difference (p = 0.002). Chronic sleep deprivation promotes sympathicotonia and a "non-dipper" blood pressure profile.

Thus, adolescents with FCP and LAH demonstrate an accumulation of modifiable risk factors—heredity, consumption of energy drinks, physical inactivity, and insufficient sleep; most of these differences are statistically significant. These findings substantiate the need for targeted lifestyle modification (sleep optimization, physical activity, avoidance of energy drinks) within an integrated treatment and prevention program.

Table 3 illustrates the extent of psycho-emotional disturbances among adolescents with functional cardiopathy/labile hypertension (main group, MG) compared to their practically healthy peers (comparison group, CG).

Perceived stress (PSS-10). The mean score in the MG was 22.1 ± 5.3 versus 14.6 ± 4.2 in the CG (p < 0.001), corresponding to a transition from the "moderate stress" to the upper "high stress" range. Every fourth adolescent with cardiovascular dysfunction (27.4%) fell into the high-stress category (≥ 27 points) compared to only 4.8% in the control group (p = 0.003).

Anxiety (HADS-A). Anxiety levels were nearly twice as high: 9.1 ± 3.0 points in the MG versus 5.3 ± 2.1 in the CG (p < 0.001).

Table 3. Proportion of psycho-emotional disturbances (%) among adolescents with functional cardiovascular abnormalities (MG) and comparison group (CG).

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
High stress level (PSS-10 ≥ 27)	23 (27.4%)	2 (4.8%)	0.003
Borderline/clinical anxiety (HADS-A ≥ 8)	45 (53.6%)	8 (19.0%)	< 0.001

Borderline/clinical depression (HADS-D ≥ 8)	18 (21.4%)	3 (7.1%)	0.041

Borderline or clinical anxiety (≥ 8 points) was observed in 53.6% of adolescents in the main group and only in 19.0% of their healthy peers ($p < 0.001$).

Depressive symptoms (HADS-D). The mean score was 6.8 ± 2.9 in the main group versus 4.1 ± 1.9 in the comparison group ($p < 0.001$). Although the absolute values remained within the "subclinical" range, the proportion of adolescents who reached the threshold of ≥ 8 points (borderline/clinical depression) was three times higher in the main group (21.4% vs. 7.1%; $p = 0.041$) (Fig. 1).

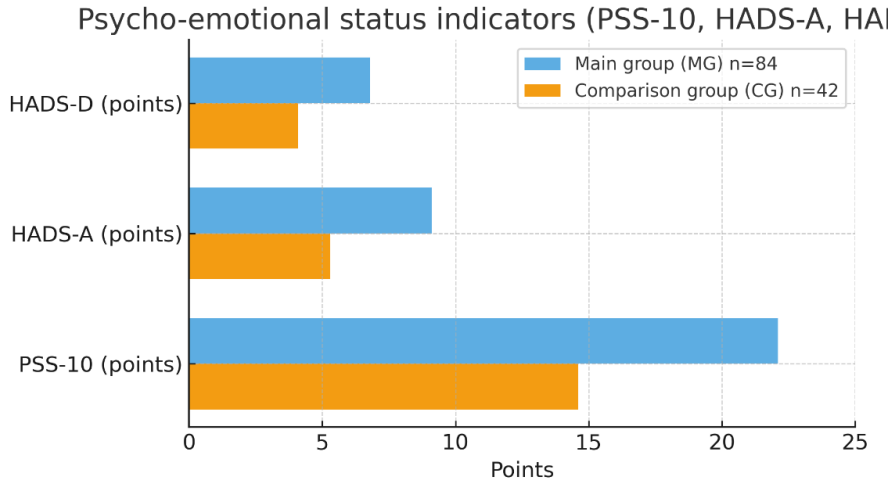

Fig. 1. Mean scores on the PSS-10, HADS-A, and HADS-D scales among conscripts with functional cardiopathy/labile hypertension (main group, MG) and the comparison group (CG). Columns represent mean values ± SD; * – p < 0.05, ** – p < 0.005.

Thus, adolescents with functional cardiovascular changes experience a significantly greater psycho-emotional burden: levels of stress, anxiety, and depressive symptoms are markedly higher across all parameters.

As shown in Table 4, young men with functional cardiovascular abnormalities (main group, MG) exhibit mean 24-hour blood pressure values within the high-normal range (128.4/78.2 mmHg), which is approximately 15/9 mmHg higher than in their healthy peers. Daytime blood pressure values are even higher (130.8/80.4 mmHg), emphasizing the vascular load during periods of daily activity.

Table 4. Indicators of 24-hour blood pressure and dystrophic daily rhythm (non-dipper) in the main and comparison groups. Elevated values and the high percentage of non-dippers in the MG indicate dysregulation of blood pressure (M ± σ).

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
ABPM — mean 24-hour SBP, mmHg	128.4 ± 7.1	113.6 ± 5.2	< 0.001
ABPM — mean 24-hour DBP, mmHg	78.2 ± 5.3	69.3 ± 4.4	< 0.001
Daytime SBP (06:00–22:00), mmHg	130.8 ± 8.3	115.7 ± 6.1	< 0.001
Daytime DBP, mmHg	80.4 ± 6.1	70.2 ± 5.0	< 0.001
Nighttime SBP (22:00–06:00), mmHg	118.6 ± 6.4	104.3 ± 5.0	< 0.001
Nighttime DBP, mmHg	70.5 ± 5.1	60.4 ± 4.3	< 0.001
Non-dippers (% of group)*	46.40%	9.50%	< 0.001

Nighttime blood pressure shows insufficient reduction (118.6/70.5 mmHg), and nearly half of the adolescents (46.4%) belong to the "non-dipper" type — an unfavorable circadian profile associated with accelerated remodeling of blood vessels and cardiac muscle. All differences between the groups are statistically highly significant ($p < 0.001$), underscoring the clinical importance of the identified imbalance.

Thus, adolescents with FCP and labile hypertension already demonstrate by age 18 a persistent increase in mean 24-hour blood pressure and disruption of nocturnal "dipping."

Table 5 presents the electrocardiographic status of adolescents — 84 young men with functional cardiovascular abnormalities (main group, MG) and 42 practically healthy peers (comparison group, CG). Sinus rhythm was observed in the vast majority of

both groups (≈93% vs. 100%); the difference was not statistically significant (p = 0.087), confirming the absence of organic pacemaker dysfunction. Sinus tachycardia (heart rate > 100 bpm) was detected in more than one in five adolescents with FCP/LAH (22.6%) and only in 4.8% of healthy peers (p = 0.015).

Table 5. Electrocardiographic status of adolescents, n (%).

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
Sinus rhythm, %	78 (92.9%)	42 (100%)	0.087
Sinus tachycardia (HR > 100 bpm), %	19 (22.6%)	2 (4.8%)	0.015
Single supraventricular extrasystoles, %	14 (16.7%)	1 (2.4%)	0.018
Early repolarization syndrome, %	21 (25.0%)	5 (11.9%)	0.071
QTc, ms (Fredericia)	403 ± 18	395 ± 15	0.012

The findings correspond with the previously demonstrated sympathicotonia and increased ΔHR during the orthostatic test. Single supraventricular extrasystoles were observed in 16.7% of the main group compared with 2.4% in the comparison group (p = 0.018), serving as an additional marker of heightened electrophysiological lability. Early repolarization syndrome was identified in one-quarter of patients (25%) and 11.9% of controls, showing a borderline statistical trend (p = 0.071). Characteristic of young males, this finding—when combined with LAH and tachycardia—requires continuous observation.

The corrected QT interval (QTc, Fredericia formula) was prolonged in the main group: 403 ± 18 ms versus 395 ± 15 ms (p = 0.012). Although within the normal range, the significant increase underscores the impact of sympatho-adrenal hyperactivation and relative electrolyte deficiency (Mg^{2+}, K^{+}) on the repolarization phase.

Summarizing the above, it can be concluded that adolescents with functional cardiopathy and labile hypertension show a higher incidence of rhythm disturbances—sinus tachycardia and supraventricular extrasystoles—as well as relative QTc prolongation. Together, these changes indicate increased electrical excitability of the myocardium. The trend toward a higher frequency of early repolarization syndrome further emphasizes the need for dynamic ECG monitoring in emotionally stressed adolescents with FCP, especially those expected to undergo high physical exertion.

Table 6 presents heart rate variability (HRV) parameters and the distribution of autonomic balance types among 84 adolescents with functional cardiovascular abnormalities (main group, MG) and 42 practically healthy peers (comparison group, CG).

Table 6. Comparison of heart rate variability (HRV) parameters in adolescents of the main and comparison groups. The data reflect reduced adaptive capacity of the cardiovascular system and autonomic imbalance in the MG (M ± σ).

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
SDNN, ms	105 ± 23	139 ± 28	< 0.001
RMSSD, ms	42 ± 14	59 ± 18	< 0.001
pNN50, %	11.8 ± 6.4	19.3 ± 7.9	< 0.001
LF, ms^2	1,227 ± 356	1,010 ± 331	0.004
HF, ms^2	615 ± 241	932 ± 278	< 0.001
LF/HF ratio	2.09 ± 0.74	1.11 ± 0.46	< 0.001

Distribution of autonomic types: Sympathicotonic (LF/HF > 2) — 51% among patients versus 10% in the control group (p < 0.001); mixed — 37% versus 69% (p < 0.001); vagotonic — 12% versus 22% (difference statistically significant) (Fig. 2).

The global reduction in HRV indices (SDNN, RMSSD, pNN50) in adolescents with FCP and labile hypertension indicates depletion of adaptive reserves and a predominance of stress-type physiological reactions. The shift of the autonomic balance toward sympathetic dominance (elevated LF and LF/HF ratios) confirms the pathogenetic role of chronic sympatho-adrenal hyperactivation, correlating with resting tachycardia, a “non-dipper” blood pressure profile, and elevated PSS-10 scores.

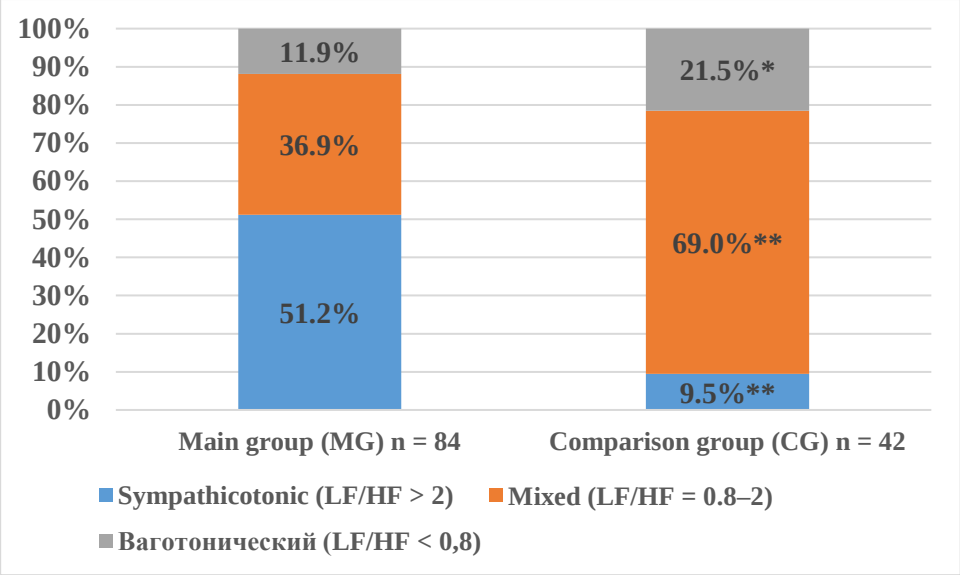

Figure 2. Distribution of autonomic types among conscripts with functional cardiopathy/labile hypertension (main group, MG) and the comparison group (CG). Bars represent mean values ± SD; * – p < 0.05, ** – p < 0.005.

Sympathicotonic individuals have a higher risk of progression from labile to sustained hypertension, as well as increased frequency of supraventricular extrasystoles and QTc prolongation. Therefore, they are recommended to prioritize non-pharmacological methods of tone reduction (bioacoustic correction, breathing training) and, if necessary, low-dose β-blockers.
Adolescents with functional cardiovascular abnormalities showed hypomagnesemia and moderate hypokalemia — a combination that promotes enhanced sympatho-adrenal tone, labile hypertension, and supraventricular arrhythmias (see Table 8). The sodium level was significantly higher, which may reflect excessive salt intake and latent fluid retention.

Thyroid profile. Although TSH remained within the reference range, it was statistically higher in the MG, while free T_4/T_3 fractions were lower. This pattern corresponds to a mild subclinical hypothyroid trend, which reduces vagally mediated regulation and worsens lipid and glycemic balance.

Table 7. Analysis of heart rate variability (HRV) parameters.

HRV Parameter	Clinical Meaning	Comparison Results
SDNN — total variability (normal ≥ 120 ms)	Reflects overall adaptive reserve	Reduced in MG to 105 ± 23 ms vs 139 ± 28 ms (-24%, p < 0.001)
RMSSD — vagally mediated variability	Characterizes parasympathetic activity	Decreased by one-third: 42 ± 14 ms vs 59 ± 18 ms (p < 0.001)
pNN50 — % of long RR intervals	Another index of vagal tone	Almost two times lower: 11.8 ± 6.4% vs 19.3 ± 7.9% (p < 0.001)
LF (0.04–0.15 Hz)	Sympathetic + baroreflex regulation	Significantly higher: 1,227 ± 356 ms² vs 1,010 ± 331 ms² (p = 0.004)
HF (0.15–0.40 Hz)	Parasympathetic component	Reduced: 615 ± 241 ms² vs 932 ± 278 ms² (p < 0.001)
LF/HF ratio	Sympatho/vagal balance (normal ≈ 1)	Twice the normal level: 2.09 ± 0.74 vs 1.11 ± 0.46 (p < 0.001)

Even within normal limits, dynamic monitoring of TSH and free T_4 every 6–12 months is recommended, along with antibody testing if TSH > 4 mIU/L.
Cardiospecific enzymes. Troponin I levels in both groups were within the normal range (< 14 ng/L), indicating no signs of acute myocardial injury. CK-MB and NT-proBNP levels were statistically higher in the main group, although still within subclinical limits. This indirectly suggests increased mechanical load and early myocardial remodeling in functional cardiopathy. Dynamic follow-up is indicated for adolescents with CK-MB > 20 ng/mL or NT-proBNP > 125 pg/mL

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Table 8. Electrolyte and thyroid profiles of the examined adolescents. The changes observed in the main group may contribute to the exacerbation of autonomic regulatory and hemodynamic disturbances (M ± σ).

Indicator	Main group (MG) n = 84	Comparison group (CG) n = 42	p-value
Sodium, mmol/L	141.2 ± 2.8	139.6 ± 2.5	0.003
Potassium, mmol/L	3.81 ± 0.27	4.05 ± 0.25	< 0.001
Ionized calcium, mmol/L	1.18 ± 0.05	1.21 ± 0.04	0.021
Magnesium, mmol/L	0.71 ± 0.06	0.78 ± 0.05	< 0.001
TSH, mIU/L	2.84 ± 0.96	2.49 ± 0.85	0.041

Free T_4, pmol/L	14.7 ± 1.9	15.5 ± 1.8	0.018
Free T_3, pmol/L	5.12 ± 0.63	5.36 ± 0.59	0.049
Troponin I, ng/L	4.3 ± 1.8	3.9 ± 1.6	0.167
CK-MB, ng/mL	13.8 ± 4.6	11.7 ± 3.9	0.014
NT-proBNP, pg/mL	72 ± 28	58 ± 22	0.006

The obtained laboratory data complement the clinical and instrumental findings, emphasizing the role of trace element deficiencies and subclinical endocrine shifts in the pathogenesis of functional cardiopathy and labile hypertension among adolescents of conscription age.

CONCLUSIONS

1. Prevalence of pathology. Functional cardiopathy and labile arterial hypertension were diagnosed in 84 out of 126 conscripts (66.7%), indicating a high prevalence and the screening importance of this problem within this age group.
2. Somatic profile. Compared with healthy peers, the patients demonstrated higher body mass and body mass index (24.3 ± 3.9 vs. 22.6 ± 3.1 kg/m²; $p = 0.004$), which confirms the contribution of excess body weight to the development of hemodynamic overload.
3. Resting hemodynamics. The affected individuals exhibited resting tachycardia (86 ± 9 vs. 75 ± 8 bpm; $p < 0.001$) and higher office blood pressure values (132/82 vs. 119/73 mmHg; $p < 0.001$), confirming the presence of borderline hypertension as early as at the age of 18.
4. Autonomic regulation. Global heart rate variability was reduced (SDNN 105 ± 23 vs. 139 ± 28 ms; $p < 0.001$), with a twofold shift of the LF/HF ratio toward sympathetic predominance (2.09 ± 0.74 vs. 1.11 ± 0.46; $p < 0.001$), reflecting depletion of adaptive reserves.
5. Circadian blood pressure profile. The mean 24-hour systolic/diastolic pressure exceeded control values by approximately 15/9 mmHg, and the proportion of “non-dippers” reached 46.4% compared with 9.5% among healthy subjects ($p < 0.001$), suggesting an increased risk of early target-organ damage.
6. Psychoemotional background. Adolescents with functional cardiopathy or labile hypertension reported higher subjective stress (PSS-10 22.1 ± 5.3 vs. 14.6 ± 4.2; $p < 0.001$), with the proportion of individuals experiencing “high” stress levels (≥ 27 points) being six times greater than in the control group.

In summary, the combination of excess body weight, sympathetic hyperactivity, borderline hypertension, impaired nocturnal dipping, and elevated stress levels forms a maladaptive phenotype among conscripts. This phenotype necessitates early detection and targeted preventive interventions to avert progression toward sustained arterial hypertension and to reduce the risk of cardiovascular complications at a young age.

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