Реферати

МОЖЛИВІСТЬ ВИКОРИСТАННЯ ДЕРМАТОГЛІФІЧНИХ ПАРАМЕТРІВ СЕРЕДНІХ ТА ПРОКСИМАЛЬНИХ ФАЛАНГ ПАЛЬЦІВ РУК У МЕЖАХ ВИМОГ DVI-INTERPOL

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Матеріалом дослідження були цифрові дерматогліфи середніх та проксимальних фаланг пальців рук, отримані від 260 представників різних етнотериторіальних груп Прикарпаття із застосуванням оптичного сканера Futronic's FS80 USB 2.0, які піддавалися кількісному та якісному вивченню та обробці методом одно- та багатомірного статистичного аналізу. У ході дослідження вивчено особливості морфологічної будови дерматогліфічних параметрів середніх та проксимальних фаланг пальців рук; розроблено «Доповнену класифікацію шкірних візерунків середніх та проксимальних фаланг пальців рук» (Авторське свідоцтво на науковий твір № 74560); запропоновано розділяти дерматогліфи середніх та проксимальних фаланг пальців рук за складністю морфологічної будови. На основі проведеного дослідження розроблено окрему самодостатню систему дерматогліфічних ідентифікаційних ознак, яка здатна підвищити та підтвердити достовірність результатів комплексної ідентифікаційної експертизи згідно критеріїв DVI Interpol.

Ключові слова: судова медицина, ідентифікація особи, дерматогліфічні параметри.

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ВОЗМОЖНОСТЬ ИСПОЛЬЗОВАНИЯ ДЕРМАТОГЛИФИЧЕСКИХ ПАРАМЕТРОВ СРЕДНИХ И ПРОКСИМАЛЬНЫХ ФАЛАНГ ПАЛЬЦЕВ РУК В ПРЕДЕЛАХ ТРЕБОВАНИЙ DVI-INTERPOL

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Материалом исследования были цифровые дерматоглифы средних и проксимальных фаланг пальцев рук, полученные от 260 представителей различных этнотерриториальных групп Прикарпатья с применением оптического сканера Futronic's FS80 USB 2.0, которые подвергались количественному и качественному изучению и обработке методом одно- и многомерного статистического анализа. В ходе исследования изучены особенности морфологического строения дерматоглифических параметров средних и проксимальных фаланг пальцев рук; разработано «Дополненную классификацию кожных узоров средних и проксимальных фаланг пальцев рук» (Авторское свидетельство на научное произведение № 74560); предложено разделять дерматоглифы средних и проксимальных фаланг пальцев рук по сложности морфологического строения. На основе проведенного исследования разработано отдельную самодостаточную систему дерматоглифических идентификационных признаков, которая способна повысить и подтвердить достоверность результатов комплексной идентификационной экспертизы согласно критериям DVI Interpol.

Ключевые слова: судебная медицина, идентификация личности, дерматоглифические параметры.

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STRUCTURAL AND FUNCTIONAL CHANGES OF THE HEART IN PATIENTS WITH ESSENTIAL HYPERTENSION AND CONCOMITANT FREQUENT EXTRASYSTOLES

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The total of 156 patients (65 men and 91 women) with stage II hypertension (EH II) were examined, with an average age of 58.2 ± 0.9 years. The main clinical array consisted of 124 patients with frequent symptomatic supraventricular (SVE) (74 (59.7%) patients) or ventricular extrasystoles (VE) (50 (40.3%) pts) according to Holter monitoring of the electrocardiogram (HM ECG). The comparison group included 32 patients with EH II without cardiac arrhythmias. Echocardiographic evaluation of structural and functional changes of the heart showed that the presence of frequent extrasystoles was associated with an increase of right ventricular (RV) size and signs of its overload, more pronounced left ventricular hypertrophy (LVH), a significant decrease in LV systolic function and impaired myocardial relaxation with the prevalence of the rigid type of transmitral flow. Patients with EH II and frequent VE compared with patients with EH II and SVE had a more significant decrease in LV systolic function and more pronounced disorders of diastolic function, whereas patients with SVE had a more expressed LVH.

Key words: arterial hypertension, essential hypertension, supraventricular extrasystole, ventricular extrasystole, echocardiography, Holter ECG monitoring.

The study is a fragment of the research project "Metabolic risk factors, cardiovascular remodeling and functional status of the kidneys in patients with cardiovascular pathology. The options of pharmacological correction", state registration No. 0119U101849.

The most common cardiac arrhythmias in patients with arterial hypertension are atrial fibrillation (AF) and extrasystole. AH as an etiology of AF occurrs in approximately 14% of patients due to a significant prevalence of AH in population. In the case of high BP levels, the risk of AF increases almost 5-fold [3, 7, 9]. While the circumstances of AF progression in patients with hypertension has been studied in great detail, the causes and mechanisms of extrasystoles is still studied insufficiently at the moment.

There is some controversy about the relationship of SVE and structural remodeling of the left ventricular (LV) myocardium. When some observed SVE independently of LVH in high systemic BP [12],

the others found some structural myocardial abnormalities after taking into account the circadian changes in BP. A greater number of SVE, an increased left atrium size, LV index of myocardial mass were found in patients with an inadequate nocturnal decrease in blood pressure (non-dippers) [2, 10].

To date, there is undeniable evidence of an association of diastolic dysfunction of the LV and the incidence of SVE in hypertension. A.V. Nedostup (2011) believes that SVE is less common in AH and manifests only in severe diastolic LV dysfunction with the development of mitral regurgitation [4]. In other studies, a positive correlation was found between the frequency of SVE and the time of isovolumetric relaxation and deceleration time of early diastolic blood flow. There was also an inverse correlation with the ratios of early and late diastolic LV filling [14].

The first reports of the onset of VE on the background of high BP and LVH were published by Messerli et al. (1984). It was found that patients with AH and ECG signs of LV hypertrophy showed a greater amount of VE than those without hypertrophy and hypertension. These data have been confirmed in several further studies [10, 13, 14]. It is considered that the combination of VE, LVH, and the ECG detected ST-segment depression is particularly dangerous. The question remains: is VE should be considered as a specific marker of malignant arrhythmias or as a marker of the severity of the disease?

It is known that LV hypertrophy in patients with hypertension is a pathomorphological basis for the development of electrical instability of the myocardium and cardiac arrhythmias. Increased myocardial stress on the background of hypertension, along with excessive post-loading, stimulate myocardial hypertrophy, its structural remodeling with a disproportionate increase in fibrotic tissue, reduction of coronary blood flow and the development of myocardial diastolic dysfunction [13]. Myocardial hypertrophy leads to the injury of the myocardial current of Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, which contributes to the prolongation of the action potential duration and can be a trigger of the re-entry mechanism, early postdepolarization, and trigger activity. Endothelial vascular dysfunction along with LVH plays a certain role in the genesis of arrhythmias [1, 11]. The presence of both significantly increases the risk of cardiac events in the future, including the risk of arrhythmia. However, there is insufficient evidence to suggest that extrasystole in patients with EH II is associated with certain structural changes in the myocardium, and further researches are required.

The purpose of the study was to assess the structural and functional changes of the myocardium in patients with stage II hypertension with concomitant extrasystoles.

Materials and methods. A thorough screening, collection of complaints and anamnesis, signing of the informed consent to participate in the study under principals of Helsinki Declaration preceded the study.

The study involved 124 patients with EH II and frequent extrasystole aged within 27 and 75 (mean age 58.2 ± 0.9) years. The comparison group included 32 patients with EH II without any arrhythmias. Their age ranged within 32 and 72 years (mean age 55.9 ± 1.7). There were 50 males (40.3%) and 74 (59.6%) females. The comparison group consisted of 15 (46.9%) men and 17 (53.1%) women. The statistical analysis between the main group and the comparison group showed that there were no significant differences ($p > 0.05$) by age and gender, which indicated the age and gender homogeneity of the examined patients [7].

Among the 124 patients with EH II and concomitant frequent extrasystole, 74 (59.7%) cases were referred to supraventricular (SVE) and 50 (40.3%) to ventricular extrasystole (VE). Arrhythmic history ranged from 1 to 27 years and averaged 8.06 ± 0.42 years. 30 patients (24.2%) in the main group experienced arrhythmia constantly during the last year as a variety of symptoms. The most common symptoms were missed heartbeat and pause in a heartbeat. Indeed, the vast majority of patients (94 (75.8%)) experienced episodic arrhythmias in the form of intermittent episodes.

All patients were examined at the inclusion stage by complete clinical, laboratory and instrumental methods to verify the main diagnosis and concomitant conditions. General clinical and anthropometric examination, office BP measurement, 12-lead ECG, HM ECG, and cardiac ultrasound were performed in all patients.

BP was measured according to the recommendations of the Ukrainian Society of Cardiologists (2013) using a sphygmomanometer “Microlife”. Electrocardiography was performed according to the standard procedure in 12 leads on the electrocardiograph "UKARD" (Hungary).

Daily HM ECG was performed using the hardware and software “DiaCard” (JSC “Solvaig”, Ukraine) according to the standard protocol [6]. Following parameters were determined for the assessment of the nature of the arrhythmia: the daily number of SVE and VE; maximal frequency of SVE and VE per 1 hour (SVE_1 and VE_1 respectively); a number of patients with paired and group VE (PVE) and their number in 24 hours.

Assessment of the structural-functional state of the heart was performed using echocardiography in one-dimensional and two-dimensional modes with color, pulse and constant-wave Doppler imaging by

the equipment «My Lab 25» (Italy) to the recommendations of the American Society of Echocardiography (ASE) and the European Society of Cardiovascular Imaging (EACVI) [8]. The type of LV geometric remodeling was determined according to A. Ganau (1992) method based on the parameters of LVMI and RWT. LV diastolic function was estimated based on the velocity of early (Ve, m/s) and late (Va, m/s) diastolic blood flow measured by PW Doppler and followed by the calculation of Ve/Va ratio [3].

Statistical processing of the study results was performed using software «Statistica» v. 12 .0 by «StatSoft» company according to the recommendations for the processing of biomedical data. Comparisons of relative values (%) were performed using the criterion χ^2. Mann-Whitney U test was used for the comparison of independent samples [5].

Results of the study and their discussion. The assessment of the structural and functional state of the heart by EchoCG showed that the patients with EH and frequent extrasystole (the main clinical group), compared with patients without heart rhythm disorders (comparison group) had a significant ($p = 0.002$) increase in RV size and RV/EDD ratio ($p = 0.004$). These findings to a certain extent indicated the right-sided overload in this group of patients (Table 1). The EDV/LVM ratio was significantly ($p = 0.02$) lower in the group of patients with arrhythmias compared to the patients without arrhythmia, which highlighted more expressed LVH in patients with extrasystole. The findings are consistent with those of other researchers who have found a relationship between the presence of LVH and the occurrence of cardiac arrhythmias [2, 10, 14]. It should be noted that the patients with arrhythmia had an increase in the incidence of the aortic valve (AV) fibrosis/calcification compared with patients without arrhythmias (44.4% vs. 25%, respectively, $p = 0.04$).

Table 1

Structural and functional state of the myocardium in patients with EH II depending on the presence of extrasystoles

EchoCG parameters	Comparison group (n=32)	Main group (n=124)	*P*
ESD, mm	33.8 (32.5; 36.9)	33.3 (31.0; 37.0)	0.43
EDD, mm	51.0 (47.4; 54.0)	50.0 (47.4; 54.0)	0.92
LA, mm	40.4 (38.0; 42.0)	40.0 (37.0; 43.0)	0.85
LAV, ml	70.0 (62.5; 73.5)	69.0 (66.0; 74.0)	0.88
LAI, mm/m^2	21.1 (19.4; 22.7)	20.7 (19.1; 22.8)	0.57
LA/EDD	0.79 (0.76; 0.82)	0.78 (0.73; 0.83)	0.35
RV, mm	24.9 (24.0; 28.4)	28.0 (25.3; 32.0)	**0.002**
RV/EDD	0.49 (0.46; 0.53)	0.55 (0.48; 0.63)	**0.004**
AoD, mm	32.8 (31.6; 34.3)	33.0 (30.0; 35.0)	0.89
PWD, mm	12.0 (11.3; 12.3)	12.0 (11.0; 13.0)	0.91
IVSD, mm	11.5 (10.1; 12.1)	12.0 (11.0; 12.9)	0.10
RWT	0.46 (0.40; 0.50)	0.47 (0.42; 0.50)	0.41
LVMI	146.0 (135.3; 159.0)	154.2 (131.0; 178.0)	0.42
EDV/LVM, ml/g	0.58 (0.54; 0.66)	0.55 (0.48; 0.61)	**0.02**
EF, %	60.3 (57.5; 63.5)	57.0 (53.0; 61.7)	**0.04**
CI, ml·min/m^2	3.4 (3.0; 3.8)	3.5 (3.0; 4.1)	0.86
Ve/Va	1.45 (1.04; 1.59)	1.25 (0.89; 1.48)	**0.04**
Structural remodeling by Ganau			
Normal type	1 (3.1%)	9 (7.3%)	0.39
Concentric remodeling	0 (0)	6 (4.8%)	0.20
Concentric hypertrophy	19 (59.4%)	70 (59.7%)	0.97
Eccentric hypertrophy	12 (37.5%)	39 (31.5%)	0.51
Diastolic transmitral flow type			
Normal	8 (25.0%)	7 (5.6%)	**0.0009**
Rigid	22 (68.8%)	103 (83.1%)	*0.07*
Pseudonormal	2 (6.2%)	14 (11.3%)	0.40
Heart valves anomalies			
AV fibrosos/calcinosis	8 (25.0%)	55 (44.4%)	**0.04**
AV fibrosos/calcinosis	3 (9.4%)	13 (10.5%)	0.85
Mitral regurgitation	27 (84.4%)	96 (77.4%)	0.39
Aortal regurgitation	2 (6.3%)	19 (15.3%)	0.18
Tricuspid regurgitation	13 (40.6%)	67 (54.0%)	0.17

Notes (hereinafter):

1. ESD and EDD - end-systolic and end-diastolic dimensions; EDV - the end-diastolic volume of the left ventricle; LA - the anterior-posterior size of the left atrium; LAV - the volume of the left atrium, LAI - index of the left atrium, RV - the anterior-posterior size of the right ventricle; AoD is the aortic diameter; PWD - thickness of the posterior wall of LV in diastole; IVSD is the thickness of the interventricular septum in diastole; RWT is the relative wall thickness; LVMI – left ventricular myocardial mass index; SI - systolic index; EF - ejection fraction, Ve / Va - early to late diastolic filling velocity, AV - aortic valve, MV - mitral valve;

2. Here and in the following tables the quantitative values are presented in the form of a median and an interquartile interval with the meanings of 25 and 75 percentiles;

3. The significance of intergroup differences calculated by the Mann-Whitney U Test

The study included only patients with no echocardiographic signs of LV systolic dysfunction (EF> 40%). However, it was noted that patients with EH II and frequent extrasystoles had a significantly ($p = 0.04$) lower EF compared with patients without cardiac arrhythmias (Table 1).

The diastolic variant of LV myocardial dysfunction was revealed among the patients (tables 1, 2). Diastolic dysfunction criteria were determined concerning novel recommendations for age-adjustment. In patients with frequent extrasystole, compared with patients without arrhythmias, there was a significant ($p = 0.04$) decrease in the value of the ratio of early to late diastolic filling rate (Ve / Va). It was indicating to the more severe left ventricular myocardial relaxation disorders in patients with EH II and frequent extrasystoles. Our data to some extent are in the agreement with the results of other studies that evidenced the presence of pronounced diastolic dysfunction in patients with SVE on the background of AH [4, 13]. Echocardiographic signs of diastolic myocardial dysfunction were as often as 94.4% in patients with frequent extrasystoles versus 75.0% in those without arrhythmias. Only 5.6% of the main group had normal transmittal blood flow while the portion of such patients in the group of EH II without arrhythmias was equal to 25% ($p = 0.0009$). The rigid type of diastolic transmittal blood flow was found in 68.8% of the comparison group, compared with 83.1% in patients with arrhythmias ($p = 0.07$). It may be evidence of increasing diastolic dysfunction in the case of extrasystoles. Pseudonormal type of blood flow was reported in 6.2% of patients with hypertension and 11.3% of patients with both (VE and SVE) extrasystoles.

The analysis of LV structural-geometric remodeling by Ganau in different clinical groups evidenced that concentric hypertrophy of the LV in patients with EH II was significantly prevalent compared with other types of LV remodeling. It was true as in patients with, as in those without cardiac arrhythmias (59.4% and 59.7%, respectively). There was no significant difference in the prevalence of any type of LV remodeling between the main and the comparison groups (Table 1).

The results of the assessment of the structural-functional state of the heart depending on the type of extrasystoles showed that patients with frequent SVE, compared with patients with VE had significantly ($p = 0.04$) lower EDV/LVM ratio (Table 2), which indicated a more pronounced degree of LVH in patients with SVE. These findings coincide with the results of other researchers who described an increase in LVMI in patients with hypertension and SVE [2, 10]. However, we did not find in the literature any comparative analysis of the LV hypertrophy, depending on the variant of extrasystoles in patients with hypertension. Thus, further studies in this direction are required.

The size of RV and the ratio of RV/ESD) were significantly ($p <0.05$) higher in patients with extrasystoles compared with patients with hypertension but without rhythm disorders (Table 2), which indicated a more pronounced overload of the right-sided heart departments in patients with extrasystoles. Simultaneously, there were no significant differences in those parameters in groups of patients with different types of extrasystoles (Table 2). It was noted that patients with SVE tended to increase RV ($p = 0.07$) compared with VE.

Patients with VE had a significantly lower EF value compared with patients with SVE (54.3 (50.2; 61.1) versus 57.0 (53.8; 63.4) %, respectively, $p = 0.02$).

Interesting that the Ve/Va rate was significantly ($p = 0.03$) lower in the group of patients with frequent VE compared with patients with SVE, indicating more pronounced diastolic abnormalities in this category of patients. Our findings regarding the presence of apparent diastolic dysfunction in patients with arrhythmias coincide with other researchers' findings of the association between the presence of SVE in patients with hypertension and diastolic dysfunction [4, 13, 14].

The vast majority of patients with EH II and extrasystoles had transmitral blood flow disorders. A rigid type of transmitral blood flow was observed in most of the patients (81.1% of patients with SVE and 86.0% with VE), whereas only 8.1% of patients and 2.0% respectively had normal transmitral blood flow. Pseudonormal type of diastolic filling of the LV was observed in 10.8% of patients with SVE and 12.0% of patients with VE [2, 10].

Analysis of the structural-geometric remodeling of LV by Ganau in clinical groups showed no significant difference between groups of patients. It was noted that in patients of both clinical groups, concentric LVH was significantly more prevalent among different types of remodeling (reported in 54.1% of SVE and 60.0% of VE cases), eccentric LVH was defined in 33.8% and 28,0% respectively.

Table 2

Structural and functional state of the myocardium in the main group depending on different types of extrasystoles

EchoCG parameters	SVE (n=74)	VE (n=50)	P
EDS, mm	33.9 (31.0; 37.0)	33.1 (30.9; 36.0)	0.54
EDD, mm	50.0 (48.0; 55.0)	50.0 (47.2; 53.5)	0.29
LA, mm	40.0 (37.0; 43.0)	40.5 (38.0; 42.0)	0.85
LAV, ml	68.0 (66.0; 74.0)	69.5 (67.0; 73.0)	0.97
LAI, mm/m^2	20.7 (18.7; 22.8)	20.6 (19.4; 22.1)	0.94
LA/ESD	0.77 (0.72; 0.82)	0.79 (0.74; 0.85)	0.13
RV, mm	28.5 (26.0; 32.0)	27.9 (24.8; 30.9)	*0.07*
RV/ESD	0.54 (0.49; 0.64)	0.55 (0.48; 0.61)	0.59
AoD, mm	32.9 (27.0; 37.0)	33.2 (28.5; 37.0)	0.47
PWD, mm	12.0 (10.0; 13.1)	12.0 (10.0; 13.0)	0.73
IVSD, mm	12.0 (9.5; 14.0)	12.0 (9.8; 14.4)	0.23
RWT	0.47 (0.36; 0.55)	0.48 (0.42; 0.53)	0.76
LVMI	154.7 (108.5; 208.2)	152.6 (109.1; 198.4)	0.32
EDV/LVM, ml/g	0.52 (0.39; 0.68)	0.56 (0.42; 0.74)	**0.04**
EF, %	57.0 (53.8; 63.4)*	54.3 (50.2; 61.1)**	**0.02**
CI, ml·min/m^2	3.5 (2.5; 5.2)	3.5 (2.7; 4.7)	0.87
Ve/Va	1.34 (0.76; 1.51)*	1.18 (0.75; 1.34)**	**0.03**
Structural remodeling by Ganau			
Normal type	5 (6.8%)	4 (8.0%)	0.79
Concentric remodeling	4 (5.4%)	2 (4.0%)	0.72
Concentric hypertrophy	40 (54.1%)	30 (60.0%)	0.51
Eccentric hypertrophy	25 (33.8%)	14 (28.0%)	0.49
Type of transmitral blood flow			
Normal	6 (8.1%)	1 (2.0%)	0.14
Rigid	60 (81.1%)	43 (86.0%)	0.47
Pseudonormal	8 (10.8%)	6 (12.0%)	0.83
Heart valves anomalies			
AV fibrosos/calcinosis	5 (6.8%)	8 (16.0%)	*0.09*
AV fibrosos/calcinosis	33 (44.6%)	22 (44.0%)	0.94
Mitral regurgitation	57 (77.0%)	39 (78.0%)	0.89
Aortal regurgitation	15 (20.3%)	4 (8.0%)	*0.06*
Tricuspid regurgitation	34 (45.9%)	33 (66.0%)	**0.02**

Notes: 1. SVE - supraventricular and VE - ventricular extrasystole; 2. The significance of difference based the Mann-Whitney U Test

Based on the assessment of the structural and functional state of the valves in patients with different extrasystoles, it was established that in patients with VE compared with SVE there were a significantly higher number of cases of tricuspid regurgitation (66.0 versus 45.9 %, respectively, p=0.02) and a tendency to more incidence of fibrosis or calcification of AV. At the same time, the number of cases of aortic regurgitation was likely to increase in the group of patients with frequent SVE [4].

Thus, the study suggests that patients with EH II and frequent extrasystoles have certain structural and functional changes of the heart compared with patients with EH II but without rhythm disorders. Namely, there was an increase in the size of RV with signs of its overload, more pronounced LVH, a significant decrease in LV systolic function and impaired relaxation of the myocardium with the predominance of rigid type of transmitral blood flow. The assessment of the structural and functional state of the myocardium depending on the type of extrasystoles allow establishing some differences in patients with EH II and frequent VE compared with those with SVE. The had a more significant decrease in LV systolic function followed by the more pronounced impairment of diastolic, while patients with SVE had a slightly higher degree of LV hypertrophy.

Conclusions

1. The presence of frequent extrasystole in patients with EH II, regardless of its type, is associated with a significant increase in size and overload of RV, more pronounced LVH, the presence of diastolic

dysfunction, impaired transmitral blood flow and increase in the incidence of fibrosis and calcinosis of the aortal valve.

2. The presence of frequent SVE in patients with stage II GC is associated with a tendency to an overload of RV and a greater degree of LVH compared with patients with EH II and VE.

3. A more significant decrease in LV EF followed by more significant impairment of diastolic function was observed in patients with EH II and VE compared with patients with SVE. Also, the incidence of tricuspid regurgitation (66.0% vs. 45.9%, p = 0.02) and fibrosis/calcification of AV were more frequent in the group of EH II and VE.

Future researches of associative links between the presence of rhythm disorders and structural and functional changes of the myocardium in patients with EH II, revealing the pathogenic mechanisms of arrhythmias in patients with hypertension, will improve the diagnosis and treatment of such complicated patients.

References

1. Belenkov YuN, Mareev YuV. Serdechno-sosudystui kontinuum. Serdechnaya nedostatochnost. 2012; 1: 7-11. [in Russian]
2. Zharinov OI, Talaieva TV, Lishchyshyna OM, Bozhko LI, Hetman TV, Zalevskyi VP. [ta in.] Adaptovana klinichna nastanova, zasnovana na dokazakh. Fibryliatsiia peredserd. Rekomendatsii Robochoi hrupy z porushen rytmu sertsia Asotsiatsii kardiolohiv Ukrainy. 2016: 11-7. [in Ukrainian]
3. Kovalenko VM, Dolzhenko MM., Potashev SV. Nastanovy z klinichnoi ekhokardiohrafiyi. 2018. 327s. [in Ukrainian]
4. Nedostup AV, Blahova OV. Kak lechyt arytmiyu. Narusheniya ritma i provodimosti v klynycheskoy praktike. 2011. 365s. [in Russian]
5. Rebrova OYu. Statystycheskyi analiz meditsinskikh dannykh. Primeneniye paketa prikladnykh programm STATISTICA. 2006. 312s. [in Russian]
6. Sychov OS, Lutai MI, Romanova OM. Ambulatorne EKH-monitoryuvannya. Rekomendatsiyi Asotsiatsiyi kardiolohiv Ukrainy. 2010. 44s. [in Ukrainian]
7. Kuzminova NV, Ivankova AV, Ivanov VP, Lozinsky SE, Knyazkova II, Gavriluk AO. Daily blood pressure pattern disorders in patients with stage II essential hypertension and frequent premature beats. Svit medytsyny ta biolohiyi. 2020; 1(71): 72-7. https://doi.org/10.26724/2079-8334-2020-1-71-72-77
8. Lang RM, Badano LP, Mor-Avi V, Afilalo J, Armstrong A, Ernande L. [et al.] Recommendations for cardiac chamber quantification by echocardiography in adults: an update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. J Am Soc Echocardiogr. 2015; 28(1): 1–39.
9. Leung AA, Daskalopoulou SS, Dasgupta K, McBrien K, Butalia S, Zarnke KB. [et al.] Hypertension Canada's 2017 guidelines for diagnosis, risk assessment, prevention, and treatment of hypertension in adults. Canadian Journal of Cardiology. 2017; *33*(5): 557-76.
10. Lip G, Coca A, Kahan T, Boriani G, Manolis AS, Olsen MH. [et al.] Hypertension and cardiac arrhythmias: a consensus document from the EHRA and ESC Council on Hypertension, endorsed by the HRS, Asia-Pacific Heart Rhythm Society APHRS and SOLEACE. Europace. 2017; 19 (6): 891-911. https://doi.org/doi:10.1093/europace/eux091.
11. Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A, Bohm M. [et al.] 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). J. Hypertens. 2013; 31(7): 1281–357.
12. Purmah Y, Proietti M, Laroche C, Mazurek M, Tahmatzidis D, Novo S. Rate vs. rhythm control and adverse outcomes among European patients with atrial fibrillation. Europace. 2017; 19 (3): 241-50. PMID: 28160483. DOI: 10.1093/europace/euw421.
13. Xu TY, Yang Y, Li JJ, Li Y, Wang JG. Left ventricular deformation in relation to the geometric pattern in hypertensive patients. Medicine. 2019; 98(4): 1-6.
14. Zeng Z, Zhou R, Liang O. Comparison of arrhythmias different left ventricular geometric patterns in essential hypertension. J. Tongji. Med. Univ. 2011; 21 (2): 93-6.

Реферати

СТРУКТУРНО-ФУНКЦІОНАЛЬНІ ЗМІНИ СЕРЦЯ У ХВОРИХ НА ГІПЕРТОНІЧНУ ХВОРОБУ І СУПУТНЮ ЧАСТУ ЕКСТРАСИСТОЛІЮ

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Обстежено 156 хворих (65 чоловіків та 91 жінка) на гіпертонічну хворобу ІІ стадії (ГХ ІІ), середній вік 58,2±0,9 років. Основний клінічний масив склали 124 з них, які за даними холтерівського моніторування електрокардіограми мали часту симптомну суправентрикулярну (СВЕ) (74 (59.7%) пацієнти) або шлуночкову екстрасистолію (ШЕ) (50 (40.3%) осіб) . До групи порівняння увійшли 32 хворих на ГХ ІІ ст. без порушень серцевого ритму. Оцінка структурно-функціональних змін серця за даними ехокардіографії показала, що наявність частої екстрасистолії асоційована із збільшенням розміру ПШ з ознаками його перевантаження, більш виразнішею ГЛШ,

СТРУКТУРНО-ФУНКЦИОНАЛЬНЫЕ ИЗМЕНЕНИЯ СЕРДЦА У БОЛЬНЫХ ГИПЕРТОНИЧЕСКОЙ БОЛЕЗНЬЮ И СОПУТСТВУЮЩЕЙ ЧАСТОЙ ЭКСТРАСИСТОЛИЕЙ

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Обследовано 156 больных (65 мужчин и 91 женщина) гипертонической болезнью II стадии (ГБ II), средний возраст 58,2±0,9 лет. Основной клинический массив составили 124 из них, которые по данным холтеровского мониторирования электрокардиограммы имели частую симптомную суправентрикулярную (СВЭ) (74 (59.7%) пациента) или желудочковую экстрасистолию (ЖЭ) (50 (40.3%) особ). В группу сравнения вошли 32 больных ГБ II ст. без нарушений сердечного ритма. Оценка структурно-функциональных изменений сердца по данным эхокардиографии показала, что наличие частой экстрасистолии ассоциирована с увеличением размера правого желудочка (ПЖ) с признаками его перегрузки, более выраженной гипертрофией левого желудочка (ГЛЖ),

достовірним зменшенням систолічної функції ЛШ та погіршенням релаксаційної здатності міокарда з переважанням ригідного типу трансмітрального кровотоку. У пацієнтів із ГХ II стадії та частою ШЕ порівняно з хворими на ГХ II стадії та СВЕ визначені більш суттєве зменшення систолічної функції ЛШ на фоні більш виразних порушень діастолічної функції серця, в той час як у хворих з СВЕ спостерігався дещо більший ступінь гіпертрофії ЛШ.

Ключові слова: артеріальна гіпертензія, гіпертонічна хвороба, суправентрикулярна екстрасистолія, шлуночкова екстрасистолія, ехокардіографія, холтерівське моніторування ЕКГ.

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достоверным снижением систолической функции ЛЖ и ухудшением релаксационной способности миокарда с превалированием ригидного типа трансмитрального кровотока. У пациентов с ГБ II стадии и частой ЖЭ по сравнению с больными ГБ II стади и СВЭ определено более существенное снижение систолической функции ЛЖ на фоне более выраженных нарушений диастолической функции сердца, в то время как у больных с СВЭ наблюдалась несколько большая степень гипертрофии ЛЖ.

Ключевые слова: артериальная гипертензия, гипертоническая болезнь, суправентрикулярная экстрасистолия, желудочковая экстрасистолия, эхокардиография, холтеровское мониторирования ЭКГ.

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SIMULATION AND PSYCHOLOGICAL TRAININGS AS METHODS OF PREVENTING EMOTIONAL BURNOUT IN DOCTORS

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The article analyzed the problem of emotional burnout in doctors, as well as the features of using and implementing medical simulation tools in the training process of medical specialists. The results of an empirical study of the simulation and psychological training effects on the psychological correction and the burnout syndrome prevention in doctors were presented. It was found that after these trainings doctors have reduced rates of emotional exhaustion, depersonalization, and improved well-being and mood. It was recommended to perform diverse psychological trainings and other psychological support and consulting procedures in the simulation training system.

Key words: medical simulation tools, simulation training, psychological training, burnout syndrome, psychological correction and prevention.

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Achieving true professional competence and skill of a doctor is preceded by a long and painstaking process of training and practical activities, associated with significant psychological stress and potential risks of emotional burnout. Words of the founder of modern medical ethics, Hippocrates: "Aliis inserviendo consumor — Giving light to others, I burn myself" not only determined the purpose of a true healer, but also reflected the psychological energy-consuming nature of the doctor's activity. This explains why the medical profession occupies one of the first places in terms of the risk of burnout syndrome [2, 12, 14].

Burnout syndrome is characterized by a pronounced combination of disturbance symptoms in the mental, somatic and social spheres of life. It is generally accepted that this is a pathological condition associated with defatigation, a state of exhaustion of vitality.

Numerous empirical studies confirm the emotional exhaustion typicality in doctors, leading to disturbances in communication and self-regulation, which can lead to negative personality changes. Thus, I.P. Nazarenko found that altruistic, practical and aesthetic types of emotional orientation are characterized by a low level of formation of burnout symptoms. At the same time, the hedonistic type of emotional orientation (associated with satisfying the need for physical and mental comfort) increases the risk of burnout, especially in people who work in psychiatry [9].

D. R. Mikov, A.M. Kulesh, S.V. Muraviov and other researchers empirically substantiated that the burnout syndrome of doctors is in a state of dynamic development and manifests itself in emotional disorders, affective states, anxiety, depression and the symptom of "driven into the corner" [8]. T.A. Vezhnovets and V.D. Pariy substantiated that the burnout syndrome prevention in medical workers should be carried out taking into account the characteristics of psycho-traumatic factors, depending on the type of work motivation [2].

The problem of preventing burnout in doctors is especially relevant today, in the context of the pandemic of the coronavirus COVID-19 pandemic. To minimize the emotional (professional) burnout syndrome of doctors, various methods of psychological correction and therapy are offered today, in