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COMPARISON OF THE PREVALENCE AND DYNAMICS OF ANXIETY, DEPRESSION AND QUALITY OF LIFE IN PATIENTS WITH CHRONIC RHEUMATIC HEART DISEASE

Abstract

The objective: The assessment of the severity, prevalence and five-year dynamics of anxiety and depression in those studied with rheumatic heart disease. **Materials and methods.** The study included 168 patients with rheumatic heart disease: mean age 58.69±0.47 years; 141 women (83.93 %) and 27 men (16.07 %). To assess anxiety and depression, the following scales were used: HADS (Hospital Anxiety and Depression Scale), CES-D (Depression Scale of the Epidemiological Research Center), and STAI (State-Trait Anxiety Inventory). Quality of life was assessed using total scales SF-36 (Short Form Medical Outcomes Study), KCCQ (Kansas City Cardiomyopathy Questionnaire), and MHFLQ (Minnesota Living with Heart Failure Questionnaire). **Results.** Initially, patients with rheumatic heart disease had mild depression and anxiety, except for the high level of state anxiety according to STAI — 48.00±0.95. More pronounced depressive disorders were revealed in patients with CHF NYHA III and IV. According to CES-D — 17.58±1.27 for FC I and 23.4±0.75 for FC IV, for HADS — 7.00±0.64 for FC I and 13.6±0.78 for FC IV. Anxiety disorders, on the contrary, were less in III and IV FC CHF: 8.5±0.49 with FC I and 8.2±1.02 with FC IV in HADS. According to STAI state anxiety — 47.58±1.22 (FC I) and 42.8±1.76 (FC IV), for trait anxiety — 42.67±1.08 (FC I) and 40.4±1.85 (FC IV). For the five-year period there was no negative and positive dynamics according to the questionnaires of anxiety and depression. The only exception was the increase in anxiety according to HADS by 0.66 points. In terms of quality of life, there was a decrease in physical health according to SF-36 by 1.78, and in overall summary score according to KCCQ by 1.55 and MHFLQ by –3.99. **Conclusions.** In patients with rheumatic heart disease, the severity of anxiety and depression is insignificant and does not increase during five years of observation. Indicators of depression are more pronounced in the group with CHF NYHA III and IV, and anxiety indicators in patients with CHF NYHA I and II. An increase in depression rates in subjects with rheumatic heart disease is associated with a deterioration in the quality of life. With an improvement in the quality of life parameters, depressive symptoms decrease, and anxiety rates increase.

Key word: *rheumatic heart disease, anxiety, depression, quality of life*

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CES-D — depression scale of Center for Epidemiological Studies, EQ-5D — EuroQol Group, HADS — Hospital Anxiety and Depression Scale, KCCQ — Kansas City Cardiomyopathy Questionnaire, MHFLQ — Minnesota Living With Heart Failure Questionnaire, SF-36 — Short Form Medical Outcomes Study, STAI — State-Trait Anxiety Inventory, VAS — visual analog scale, CAD — coronary artery disease, TA — trait anxiety, SA — state anxiety, FC — functional class, AF — atrial fibrillation, CRHD— chronic rheumatic heart disease, CHF — chronic heart failure

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The high prevalence of anxiety and depressive disorders and their relationship with cardiovascular diseases has long been known. Anxiety and depression significantly affect patients' quality of life, their adherence to treatment and performance [1]. It is noted that people with depression often develop coronary artery disease, myocardial infarction, stroke and sudden death, even in the case of unexpressed depressive symptoms [2]. In addition, both the cardiovascular diseases themselves lead to anxiety and depressive disorders, and anxiety with depression affect heart rhythm disturbances, the duration of angina attacks and the frequency of coronary events. At the same time, anxiety disorders are associated with an increase in the risk of coronary artery disease (CAD) by 26–41 %, and cardiovascular disease by 52 % in the case of long-term follow-up [3, 4]. Literature indicates that the increase in the severity of depression by 1 point on the Zung self-assessment scale increases mortality by 8 % [5]. But data on the relationship between anxiety disorders and increased risk of mortality from coronary artery disease has not been obtained [3]. However, anxiety disorders may be associated with an increased risk of coronary events [6].

The outcome of most cardiovascular diseases is chronic heart failure (CHF), which largely determines their course and prognosis. The prevalence of anxiety and depressive disorders in patients with CHF of ischemic etiology ranges from 14 % to 60 % according to the literature. Severe depression is seen in 17.25 % of the subjects, moderate — in 20.9 % and mild — in 27.3 % [7]. According to the literature, the severity and frequency of anxiety and depressive disorders in CHF can be influenced by the following factors [8–12]: functional class (FC) of CHF (especially III and IV FC); its duration; the age of the patient (older or younger than 60 years); sex (in case of ejection fraction less than 40 % females dominate); concomitant pathology (diabetes mellitus); economic status (socially vulnerable patients and unemployed); level of education (lower level of education); place of residence (living in the city); degree of awareness on CHF (lack of information about CHF and methods of its treatment).

Depression is an additional factor affecting the physical, mental and social activity of patients with CHF. Often accompanying CHF paroxysmal and permanent atrial fibrillation leads to increased anxiety and depression [1]. Depressive disorders also affect the life expectancy of patients with CHF. It is believed that the mortality of patients with depression is 25 % compared to 11.3 % of patients without signs of disorders. Data on the dynamic monitoring of patients with CHF due to acquired heart defects [13] and the incidence of anxiety and depression in such patients are few [14].

The **objective** of the work was to assess the severity, prevalence and five-year history of anxiety and depression in subjects with chronic rheumatic heart disease (CRHD).

Materials and methods

The study included 168 patients with CRHD who underwent inpatient treatment at the regional cardiology dispensary and signed an informed consent. The average age of the subjects was 58.69±0.47 years; 141 women (83.93 %) and 27 men (16.07 %). From subjects diagnosed with CRHD we selected only patients who had mitral stenosis as a reliable symptom of rheumatic defect. The absence of mitral stenosis was the exclusion criterion.

To obtain more objective estimates of FC we used a 6-minute walk test. Twenty-two subjects (13.1 %) had FC I, 77 (45.8 %) — FC II, 60 (35.7 %) — FC III, 9 (5.4 %) — FC IV. In addition, dyspnea was assessed on a visual analog scale (VAS) of 100 mm. Echocardiography was carried out on Philips Affinity 50 with the assessment of the linear dimensions of the heart, the pressure gradients on the valves.

The following scales of anxiety and depression assessment were used in the assessment of anxiety and depression: hospital anxiety and depression scale (HADS) with assessment: 0–7 — normal; 8–10 points — subclinically expressed anxiety/depression; 11 points and more — clinically expressed anxiety/depression. Depression Scale of the Center for Epidemiological Studies (CES-D) with assessment: 0–17 points — normal; 18–26 points — mild depression; 27–30 points — moderate depression; 31 points and above — severe depression. State-Trait Anxiety Inventory (STAI) with assessment of anxiety: up to 30 points — low, 31–44 points — moderate; 45 and more — high [15]

with the assessment of state (SA) and trait anxiety (TA). TA reflects a person's predisposition to anxiety and suggests a tendency to perceive many situations as threatening. TA is activated by the perception of certain stimuli, which are regarded as dangerous for self-assessment and self-esteem. SA (or situational anxiety) is characterized by subjectively experienced emotions: tension, anxiety, nervousness and restlessness. SA occurs as an emotional reaction to a stressful situation and can be different in intensity and responsiveness over time.

Quality of life was assessed using the general questionnaire titled Short Form Medical Outcomes Study (SF-36 V. 1) evaluating the quality of life for the last 4 weeks with scores on 8 scales and forming two summary measures: physical and mental health component. Kansas City Cardiomyopathy Questionnaire (KCCQ) with an assessment of two total indicators: functional status and total clinical indicator. Specific for CHF Minnesota Living With Heart Failure Questionnaire (MHFLQ), consisting of 21 points. The scale of life quality assessment from the EuroQol Group EQ-5D questionnaire was also used.

The IBM SPSS Statistics 23.0 software with t-test evaluation for independent samples, Kruskal-Wallis test and Pearson correlation was used for statistical processing of the obtained data. The differences were considered as statistically significant at $p < 0.05$.

Results

Initially, the prevalence of CES-D depression in subjects with CRHD was: 39.9 % — normal; 38.7 % — mild depression; 8.9 % — moderate depression; and 12.5 % severe depression. By HADS (depression): 39.9 % — normal; 36.3 % — subclinically expressed depression; 23.8 % — clinically significant depression. Incidence of anxiety by HADS (depression) was: 36.9 % — normal; 32.2 % — subclinically expressed anxiety; 30.9 % — clinically significant anxiety. According to STAI, mild SA occurred in 3.0 % of the subjects; moderate SA — in 33.3 % of the subjects; severe SA — 63.7 % of the subjects. The prevalence of TA in STAI was low in 10.7 %; moderate in 52.4 %; high in 36.9 % of patients with CRHD. The average distance in 6-minute walk test in patients was 330.91±8.42 meters and for 5 years it slightly decreased to 324.92±8.42 meters, but the value remained within the range of CHF of FC II. Dyspnea, which is one of the main symptoms of CHF, although it increased according to VAS for dyspnea assessment from 47.21±2.90 mm to 50.58±3.74 mm, the increase was insignificant.

When assessing the echocardiographic parameters (Tab. 1) there was a statistically significant increase in the size of the left atrium by 0.25 cm, the aorta — by 0.12 cm and a decrease in mitral valve orifice area — by 0.10 cm^2 for five years. Pressure on the aortic valve also increased in patients with combined

Table 1. *5-year dynamics of echocardiographic parameters*

Echocardiographic parameters	Average value		p
	Initial	After 5 years	
Aorta, cm	3.27±0.03	3.39±0.03	0.001
Left atrium, cm	4.83±0.06	5.08±0.06	0.001
LVED, cm	5.51±0.06	5.51±0.06	0.951
LVES, cm	3.64±0.05	3.63±0.06	0.771
Ejection fraction, %	61.97±0.5	61.38±0.7	0.362
IVS, cm	1.16±0.03	1.14±0.03	0.550
LVPW, cm	1.11±0.03	1.29±0.32	0.139
Right ventricle, cm	2.83±0.05	2.74±0.06	0.127
Right atrium, cm	4.62±0.27	4.80±0.16	0.585
MVA, cm^2	1.88±0.05	1.78±0.04	0.026
Left ventricle — aorta pressure, mmHg	25.51±2.00	32.98±3.74	0.006
Pressure in TV, mmHg	33.89±1.02	35.16±1.36	0.348

Note: LVED — left ventricle end-diastolic dimension, LVES — left ventricle end-systolic dimension, IVS — interventricular septum, LVPW — left ventricular posterior wall, MVA — mitral valve area, TV — tricuspid valve

aortic stenosis by 7.47 mmHg. There were no significant changes in other indicators over the time.

Evaluation of the total indicators of changes in quality of life over time showed the following results (Tab. 2). In subjects, changes in indicators of the physical health component SF-36 by 1.78, functional status according to KCCQ — by 1.55 and MHFLQ — 3.99 over the 5 years were statistically significant, which reflected deterioration of quality of life. For other values, there was also a deterioration in the quality of life by 0.78 in the mental health component of SF-36 and by 2.31 on EQ-5D scale, also an improvement by 1.76 on the KCCQ clinical status scale, but the changes were statistically insignificant.

With the above-mentioned changes in the test distance of 6-minute walk, dyspnea, echocardiographic parameters and quality of life, the subjects had mild depression according to CES-D both at baseline (20.02±0.86) and after 5 years of follow-up (20.63±0.79). According to the HADS questionnaire, although the indicators of depression conditionally increased from normal values (7.98±0.35) to subclinically expressed depression (8.04±0.36), the growth was statistically insignificant (Tab. 3). The rate of anxiety according to HADS matched subclinically expressed anxiety — 8.06±0.39 and slightly, but statistically significantly increased after 5 years (8.72±0,32). The results of the evaluation for STAI questionnaire showed a high level of SA equal to 48.00±0.95 and 46.9±1.04 (after 5 years) and moderate level of TA equal to 39.58±0.86 and 39.66±0.89 (after 5 years) without statistically significant changes in indicators.

When the dependence of anxiety and depressive disorders on CHF was initially assessed, it was found that the depression index according to CES-D increased by 5.8 points from 17.6±1.27 in the group with FC I to 23.4±0.75 in the group with FC IV, but the increase was insignificant (Tab. 4).

Table 2. *5-year quality of life dynamics*

Quality of life questionnaires	Average value		p
	Initial	After 5 years	
Scale EQ-5D	52.86±1.70	50.55±1.96	0.233
SF36, Physical health	35.79±0.78	34.01±0.77	0.008
SF36, Mental health	38.94±1.13	38.16±0.88	0.505
KCCQ, Overall summary score	22.61±0.78	21.06±0.78	0.020
KCCQ, Clinical summary score	48.70±1.96	50.46±1.72	0.369
MHFLQ	43.79±1.65	47.78±1.96	0.033

Table 3. *Dynamics of anxiety and depression according to the questionnaires*

Scale of anxiety/depression	Mean difference	95 % CI	p
CES-D	–0.61	–1.91 — 0.69	0.357
HADS (anxiety)	–0.66	–1.25 — –0.07	0.280
HADS (depression)	–0.06	–0.71 — 0.59	0.855
STAI (state anxiety)	1.10	–0.41 — 2.61	0.153
STAI (trait anxiety)	–0.08	–1.34 — 1.18	0.900

Note: CI — confidence interval

Table 4. *Changes in anxiety and depression depending on CHF NYHA FC*

Scale of anxiety/depression	p	FC I	FC II	FC III	FC IV
CES-D	0.410	17.6±1.27	20.8±0.85	20.1±0.94	23.4±0.75
HADS (depression)	0.001	7.0±0.64	7.8±0.32	7.9±0.37	13.6±0.78
HADS (anxiety)	0.074	8.5±0.49	8.7±0.41	8.1±0.42	8.2±1.02
STAI (state anxiety)	0.042	47.6±1.22	47.1±0.93	48.4±0.98	42.8±1.76
STAI (trait anxiety)	0.008	42.7±1.08	38.7±0.87	42.0±0.91	40.4±1.85

According to the HADS scale, depression increased from the absence in FC I (7.00±0.64) to clinically significant depression in FC IV (13.6±0.78). Indicators of anxiety, on the contrary, in contrast to the indicators of depression, decreased with the increase of CHF FC. And if the decrease by 0.3 points according to the HADS anxiety scale was insignificant and remained within the range of subclinically expressed anxiety, the decrease in the anxiety indicators of the STAI questionnaire from FC I to FC IV was statistically significant in terms of SA and TA. TA decreased by 2.27 points in moderate anxiety and SA decreased from high anxiety to moderate by 4.78 points.

Re-assessment of anxiety and depressive disorders after five years of follow-up (Tab. 5) although it showed a decrease in depression from the group of FC I to the group of FC IV according to CES-D by 4.58 points, on HADS scale — by 0.58 points, the indicators were not statistically significant. No statistically significant results of increased anxiety on STAI scales were also obtained from the anxiety values: SA by 6.6 points and TA by 2.2 points.

Since the influence of atrial fibrillation (AF) on the course of CHF and quality of life is often discussed in the literature, the indicators of anxiety and depressive disorders were compared depending on the presence of sinus rhythm (49.4 % of the subjects) or permanent AF (51.6 %) (Tab. 6). There were no significant differences in depressive and anxiety disorders between the groups. Depression and CES-D scores were consistent with mild depression, and the HADS score was subclinically expressed depression in both groups. On the HADS scale, there was also subclinically expressed anxiety in both groups. According to the STAI questionnaire, moderate anxiety for TA and high anxiety for SA was revealed both in the case of sinus rhythm and in the case of permanent AF.

Table 5. *Indicators of anxiety and depression depending on CHF NYHA FC after 5 years of observation*

Scale of anxiety/depression	p	FC I	FC II	FC III	FC IV
CES-D	0.539	19.3±2.1	21.0±1.16	19.6±1.18	14.7±1.11
HADS (depression)	0.098	7.3±0.97	8.4±0.43	6.4±0.0.70	6.7±1.48
HADS (anxiety)	0.149	7.9±0.85	8.5±0.49	8.9±0.38	7.0±0.37
STAI (state anxiety)	0.801	48.1±3.07	47.0±1.43	48.3±1.91	54.7±4.82
STAI (trait anxiety)	0.670	39.5±3.13	40.6±1.25	40.0±0.98	41.7±0.84

Table 6. *Severity of anxiety and depression depending on the presence of AF*

Scale of anxiety/depression	p	AF	95 % CI	SR	95 % CI
CES-D	0.883	19.3±0.59	18.34–20.47	20.98±0.85	19.31–22.66
HADS (depression)	0.462	7.88±0.33	7.23–8.53	7.95±0.31	7.34–8.57
HADS (anxiety)	0.945	7.72±0.34	7.04–8.40	9.02±0.34	8.34–9.69
STAI (state anxiety)	0.214	47.8±0.80	46.22–49.38	47.42±0.83	45.79–49.06
STAI (trait anxiety)	0.287	41.28±0.73	39.82–42.74	40.81±0.78	39.27–42.35

Note: AF — atrial fibrillation, SR — sinus rhythm, CI — confidence interval

Table 7. *Correlation of total scales of quality of life questionnaires with anxiety and depression indicators*

Scale of anxiety/depression	SF 36 (PH)	SF 36 (MH)	KCCQ (OSS)	KCCQ (CSS)	MHFLQ	Scale EQ-5D
CES-D	–0.44**	–0.67**	–0.37**	–0.51**	0.52**	–0.32**
HADS (depression)	–0.46**	–0.64**	–0.41**	–0.38**	0.46**	–0.39**
HADS (anxiety)	–0.32**	0.42*	–0.23**	–0.45**	0.47**	–0.11
STAI (state anxiety)	0.437**	0.58**	0.37**	0.52**	–0.59**	0.28**
STAI (trait anxiety)	0.30**	0.47**	0.26**	0.44**	–0.51**	0.21**

Note: PH — physical health, MH — mental health, OSS — overall summary score, CSS — clinical summary score,
* — correlation is significant at the level 0.05, ** — correlation is significant at the level 0.01

The correlation analysis revealed the inverse relationship of average strength between depression indicators on the CES-D scale and quality of life: mental health component of SF-36, total clinical indicator of KCCQ and MHFLQ (Tab. 7). And a direct relationship of average strength between the values of reactive anxiety by STAI with the mental health component of SF-36 and the total clinical indicator of KCCQ. Overall, using all the main scales of the questionnaire of quality of life, there was a significant correlation with weak or moderate strength of relation. Anxiety and depressive changes were correlated with the total parameters of SF-36 questionnaire — physical and mental health component; KCCQ — functional status and total clinical indicator and MHFLQ data. The higher the quality of life according to the summary scales of questionnaires, including the EQ-5D scale of health, the greater the severity of anxiety disorders was. And the severity of depression increased as the quality of life decreased.

Discussion

Initially, patients with CRHD had a slight expression of depression and anxiety. The exception was the indicator of SA according to STAI, which had more than 45 points (48.00±0.95) and was consistent with the high level of anxiety. Although in the literature [15] for CHF of non-ischemic etiology, the level of SA is indicated at the level of 34.3±12.5, and TA — 34.5±11.7, and the prevalence of anxiety according to HADS ranges from 24.7 % (moderate) to 32.6 % (high) [8]. During the five-year follow-up period of the study with CRHD there were no negative changes in terms of the 6-minute walk test and VAS for dyspnea. The mitral valve orifice area of 0.1 cm^2 decreased significantly, the linear dimensions of the left atrium increased by 0.25 cm and the quality of life in the physical health component of SF-36 deteriorated by 1.78, the functional status of KCCQ — by 1.55 and MHFLQ — by –3.99. Against this background, for 5 years there were no expressed negative and positive changes according to the questionnaires for anxiety and depression assessment. The only exception was the increase in anxiety according to HADS by 0.66 points.

Changes in the indicators of anxiety and depression were obtained in the initial assessment of patients depending on FC of CHF. The severity of depressive disorders increased in subjects with III and IV FC of CHF. According to CES-D from 17.58±1.27 with FC I to 23.4±0.75 with FC IV, and according to HADS from 7.00±0.64 with FC I to 13.6±0.78 with FC IV, which is consistent with the literature data [8]. On the contrary, anxiety disorders decreased with FC III and IV: from 8.5±0.49 with FC I to 8.2±1.02 with FC IV according to HADS scale. According to STAI questionnaire there was also a reduction of anxiety indicators: according to SA from 47.58±1.22 (FC I) to 42.8±1.76 (FC IV), TA from 42.67±1.08 (FC I) to 40.4±1.85 (FC IV). After 5 years, the reverse pattern was observed: there was a decrease in depression on the CES-D and HADS in subjects with CHF NYHA III and IV and an increase of anxiety indicators on the HADS and STAI in comparison with patients with FC I and II; however, there was no statistical significance of the differences. However, the literature indicates that the level of depression should increase with longer duration of CHF [8].

As it turned out, the presence of permanent AF in subjects with CRHD does not make an additional contribution to the worsening of anxiety and depressive disorders. Anxiety and depression indicators were mostly moderate in the group with AF and sinus rhythm, and did not differ significantly. The literature, on the contrary, indicates an increase in the level of anxiety by 18.2 % and depression by 20.9 % in comparison with patients without arrhythmia [1]. However, this pertains to patients with CHF of ischemic origin.

Since, on the one hand, the presence of anxiety and depression worsens the quality of life of people [11], and on the other hand, the presence of anxiety and depression in itself is a manifestation and outcome of a reduced quality of life, the correlation of these indicators was assessed. Almost all the total scales of non-specific quality of life questionnaires showed an inverse significant correlation at the level of 0.01 in terms of depression and direct anxiety on the scales for SA and TA assessment of the STAI questionnaire with weak-to-moderate strength of relation. This means that the better the quality of life of patients with CRHD, the more pronounced the anxiety and the less pronounced the depression. Similar results were obtained for the CHF-specific MHFLQ questionnaire: the higher

the MHFLQ indicator (worse quality of life), the more pronounced the depression and the less pronounced the anxiety. This is probably due to the fact that anxiety is an emotional reaction and with a prolonged low quality of life grows into depression, and the latter, according to literature, is closely related to the low quality of life [9]. Conversely, patients with better quality of life are more concerned about their health and have an increased level of anxiety.

Conclusion

Thus, in patients with CRHD the severity of anxiety and depression is insignificant and does not increase within five years of follow-up. Indicators of depression are more pronounced in the group of subjects with FC III and IV of CHF, as well as indicators of anxiety in patients with FC I and II of CHF. The increase in the indicators of depression in subjects with CRHD is associated with a deterioration in the quality of life. With the improvement of the quality of life, depressive manifestations decrease, and anxiety indicators increase.

Conflict of interests

The authors declare no conflict of interests.

References:

1. Skurikhina O.N., Miller O.N. Levels of anxiety and depression in patients with paroxysmal and chronic atrial fibrillation. Journal of arrhythmology. 2009; 55: 14-18. [in Russian]
2. Chazov E.I., Oganov R.G., Pogosova G.V., et al. Clinical and epidemiological program for studying depression in cardiological practice in patients with arterial hypertension and ischemic heart disease (COORDINATE): results of the therapeutic part of multicenter study. Heart: magazine for practicing doctors. 2007; 33 (1): 44-48. [in Russian]
3. Celano C.M., Millstein R.A., Bedoya C.A., et al. Association between anxiety and mortality in patients with coronary artery disease: A meta-analysis. Am Heart J. 2015;170(6):1105-1115. https://doi.org/10.1016/j.ahj.2015.09.013
4. Emdin C.A., Odutayo A., Wong C.X., et al. Meta-Analysis of Anxiety as a Risk Factor for Cardiovascular Disease. Am J Card. 2016; 118(4):511-519. https://doi.org/10.1016/j.amjcard.2016.05.041
5. Murberg T.A., Furze G. Depressive symptoms and mortality in patients with conges five heart failure: a six year follow up study. Med Sci Monit. 2004; 10(12):643–648.
6. Roest A.M., Martens E.J., de Jonge P., et al. Anxiety and Risk of Incident Coronary Heart Disease: A Meta-Analysis. J Am Coll Cardiol. 2010; 56(1) :38-46. https://doi.org/10.1016/j.jacc.2010.03.034
7. Delville C.L., McDougall G. A systematic review of depression in adults with heart failure: instruments and incidence. Issues Ment Health Nurs. 2008; 29(9): 1002–1017.
8. Polikandrioti M., Goudevenos. J., Michalis L.K., et al. Factors associated with depression and anxiety of hospitalized patients with heart failure. Hellenic J Cardiol. 2015; 56(1):26-35.
9. Carels R.A. The association between disease severity, functional status, depression and daily quality of life in congestive heart failure patients. Qual. Life Res. 2004; 13(1): 63–72.
10. Dekker R.L., Peden A.R., Lennie T.A., et al. Living with depressive symptoms: patients with heart failure. Am. J. Crit. Care. 2009; 18(4): 310–318.
11. Johansson P., Dahlström U., Broström A. Consequences and predictors of depression in patients with chronic heart failure: implications for nursing care and future research. Prog. Cardiovasc. Nurs. 2006; 21 (4): 202–211.
12. Yakushin S.S., Filippov E.V. The main directions of the primary prevention of cardiovascular disease. Nauka molodykh (Eruditio Juvenium). 2014; 4:55-68. [in Russian].
13. Petrov V.S. Result of 5-year observation for patients with rheumatic heart disease. IP Pavlov Medical Biological Herald 2015; (3):83-7. doi: 10.17816/pavlovj2015383-87 [in Russian].
14. Khan S.A., Azhar S., Asad S.M., Iqbal A., Kousar R., Ahmad M., et al. Assessment of anxiety and depression in hospitalized cardiac patients of Faisalabad Institute of Cardiology, Pakistan. Trop J Pharm Res. 2016; 15(11):2483-2488. http://dx.doi.org/10.4314/tjpr.v15i11.25
15. Jiang W., Kuchibhatla K., Cuffe M.S., Christopher E.J., Alexander J.D., Clary G.L., et al. Prognostic Value of Anxiety and Depression in Patients With Chronic Heart Failure. Circulation. 2004. 110(22):3452-6. https://doi.org/10.1161/01.CIR.0000148138.25157.F9

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