The Internal Picture of the Disease – Influence of Mental State and Quality of Life on Hypertension and Ischemic Heart Coronary Heart Disease Patients

**Boris Fishman[1]*, Antonina Savolyuk[2], Larisa Fomenko[1], Grigoriy Shvartsman[3]
Prozorova Irina[1], Fedchenko Pavel[1], Yegor Rumyantsev[1]**

[1]*Yaroslav-The-Wise Novgorod State University, Veliky Novgorod, Russia.
[2]Central Clinical Hospital, Veliky Novgorod, Russia.
[3]North-Western State medical University named after I. I. Mechnikov, Saint-Petersburg, Russia.

Fishman@mxc.ru

Corresponding Author: *Boris Fishman, Yaroslav-The-Wise Novgorod State University, Veliky Novgorod, Russia.*

Abstract

Hypertension and ischemic heart disease cause huge damage to the health of the population, being the strongest risk factor for the excess mortality of the population. We must not forget that we diagnose and provide treatment in the first place to a person suffering from a disease. At the same time, the personality, as an integral individual, reacts to changes inside and outside the body at all levels, determining the quality and effectiveness of treatment.

Keywords: *mental state, quality of life, cardiologic patient.*

INTRODUCTION

Cardiovascular diseases (CVD) have a number of features that have determined their choice for our study. Excessive mental load became ordinary for most employed individuals of the population [2,3,6,10]. Further improvement of diagnostics and complex therapy of cardiac patients is important to create a practical interdisciplinary disease prevention system that takes into account the entire clinical complex and the internal picture of the disease [4,5,14,17].

Previously, this problem was studied by the scientific school of Professor Ananyev VA. and the proposed materials are a continuation of ideas that he developed during his lifetime in the theory of adaptation and re-adaptation, disease and human health.

METHODS

Clinical, epidemiological, sociological, psychometric, descriptive, statistical and mathematical methods were used. Type of study chosen: prospective, follow-up duration - 1 year. Patients received basic therapy recommended in practical public health institutions. Surveys were conducted on the basis of polyclinic №3 of Veliky Novgorod.

The study included 105 patients with exertional angina pectoris, including 37 women (mean age 61.05 ± 8.17) and 68 men (55.0 ± 9.01), women significantly older (p <0.001). In the group of patients with myocardial infarction, 105 patients were examined, including 36 women (mean age 63.0 ± 9.46) and 69 men (55.2 ± 10.9), women significantly older (p <0.001). In the group of patients with heart failure, 105 patients were examined, including 22 women (mean age 65.1 ± 6.7) and 83 men (mean age 58.3 ± 8.4).), women significantly older (p <0.01).

Mental state was determined using personal questionnaires: HADS (Hospital Anxiety and Depression Scale), stress interview, MMPI Mini-Mult test (ZaytsevaV.P. modification), FPI (Freiburger Persönlichkeitsinventar), TAS (Toronto Alexithymia Scale), STAI (State-Trait Anxiety Inventory), NHP (Nottingham Health Profile) .

Patient's quality of life was estimated using questionnaires: SF-36 (The Medical Outcome study Short Form 36 Health Survey) (Davies A.R., Ware J.E., 1981); MLHF (Minnesota Living with Heart Failure Questionnaire) (Rector T.S., Kubo S.H., Cohn J.N., 1987.

Statistical and mathematical calculations were performed using statistical software Statistica 10, Russian version (2012), license number AGAR207F394525FA-6.

RESULTS

The study of the internal picture of the disease included an assessment of the socio-psychological, mental status, quality of life of patients.

It was found that the group of patients with exertional angina pectoris, previous myocardial infarction and heart failure did not have significant statistical differences in terms of medical and demographic indicators. At the same time, when comparing the groups by diagnosis, age differences were noted only in groups with exertional angina pectoris and heart failure at p > 0.05 due to a younger group of patients with excertional angina. The proportion of working people is higher in the group of patients with angina and with myocardial infarction when compared with the group of patients with heart failure (p <0.05). Proportion of patients with a disability was significantly higher in group of patients with heart failure (p <0.01 when compared with a group of patients with angina and p <0.001 with a group of patients with myocardial infarction).

According to the conjugacy distribution table (using χ^2 Mantel-Haenszel), of all risk factors, a negative relationship was found with the diagnosis: by sex ($\chi^2 = 6.604$ at P = 0.037); age ($\chi^2 = 4.61$ at P = 0.032); frequency of hospitalization ($\chi^2 = $ is 9.078 at P = 0.003); satisfaction with work ($\chi^2 = 8.98$ at P = 0.016); the frequency of surgical interventions ($\chi^2 = 19,557$ at P = 0.001). The rest of the indicators have no connection.

Results demonstrated a significant anxiety representation in the surveyed contingents of patients.

Thus, in 23% of patients with ischemic heart disease (IHD) 76% have high personal anxiety. According to STAI questionnaire, patients with IHD have higher levels of both personal (57 points) and situational anxiety (51 points) compared to myocardial infarction patients (personal anxiety is 43 points, situational anxiety – 46, t = -2.44 for P = 0.0174).

In a combined assessment of the mental health of patients using NHP questionnaire and HADS subscales, results show severity of changes in the social status of patients and their physical state depending on the form of IHD, and the prevalence of the depression index over the anxiety state with negative dynamics (Figure 1).

The most significant change in the NHP results was observed in social (-5.1 ± 0.78) and in the physical scale. The index of depression slightly exceeds the anxiety index (p <0.001).

Patients with myocardial infarction and angina pectoris develop changes mostly in social and physical indices. Moreover, in patients with angina pectoris, the scores of the social index are 2 times higher than those of the physical state index. No changes in emotional index observed in patients with both exertional angina and myocardial infarction.
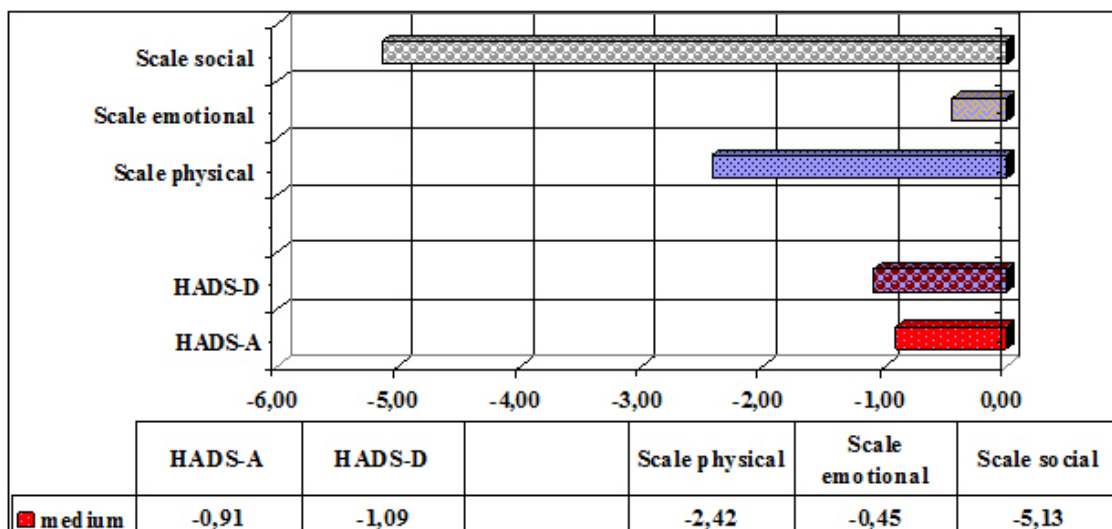

	HADS-A	HADS-D		Scale physical	Scale emotional	Scale social
medium	-0,91	-1,09		-2,42	-0,45	-5,13

Figure 1. *Mental health indices of patients by NHP questionnaire and HADS subscales*

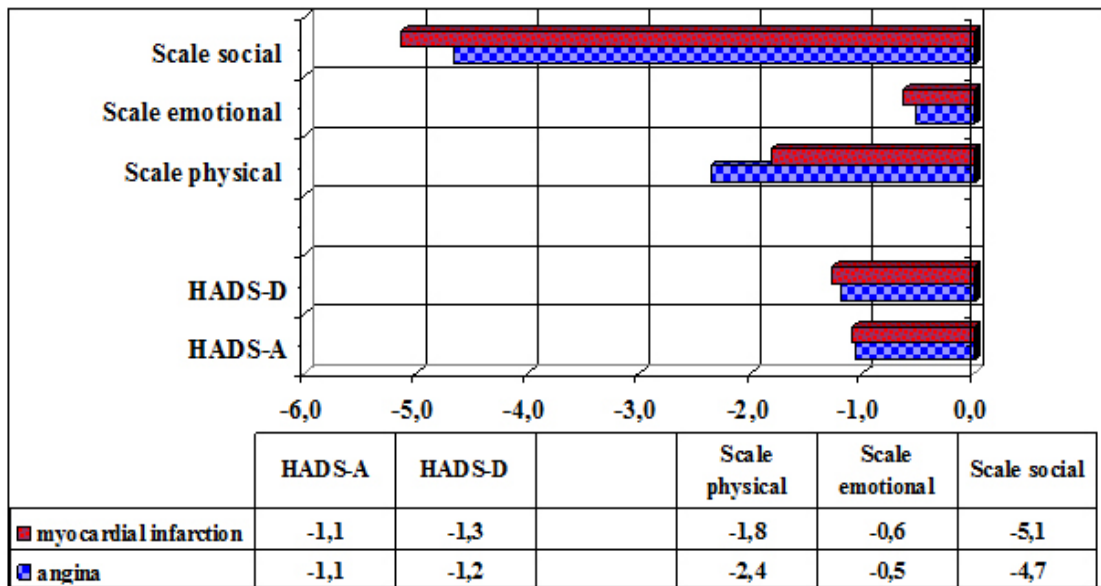|	HADS-A	HADS-D		Scale physical	Scale emotional	Scale social
■ myocardial infarction	-1,1	-1,3		-1,8	-0,6	-5,1
▨ angina	-1,1	-1,2		-2,4	-0,5	-4,7

Figure 2. *Mental health indices of patients with myocardial infarction and exertional angina by NHP questionnaire and HADS subscales*

Collation of mental state indices of patients with myocardial infarction and heart failure showed significant differences between groups (Figure 3).

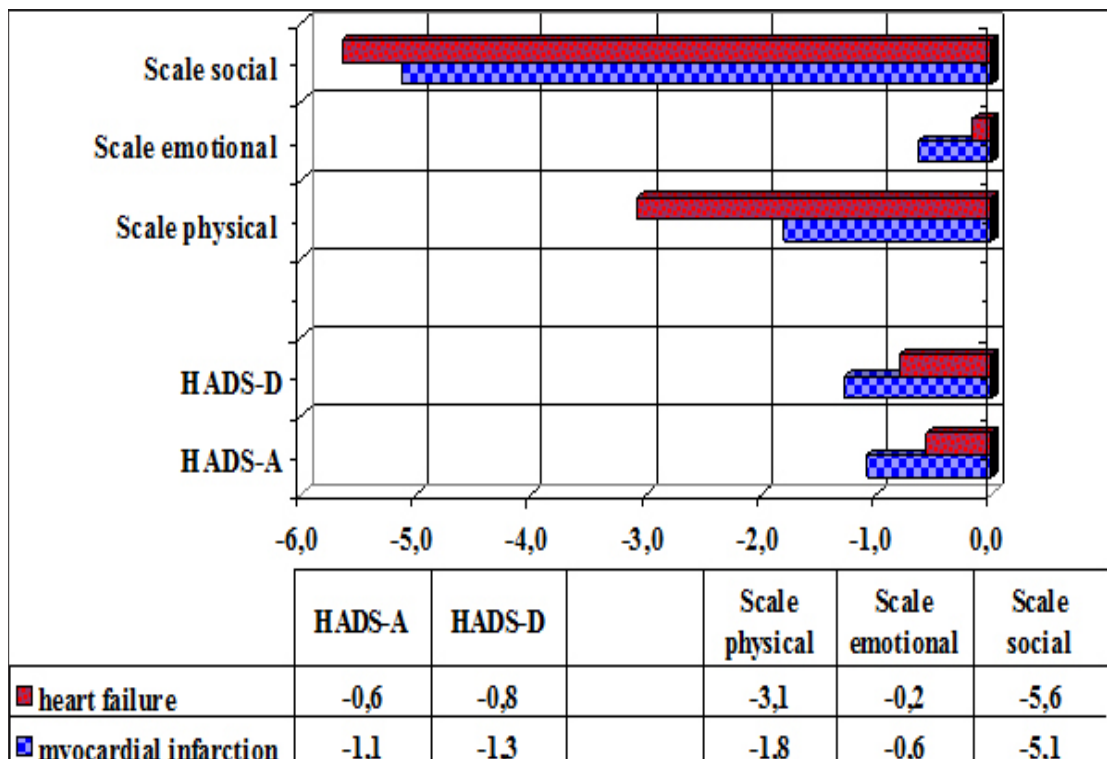|	HADS-A	HADS-D		Scale physical	Scale emotional	Scale social
■ heart failure	-0,6	-0,8		-3,1	-0,2	-5,6
▨ myocardial infarction	-1,1	-1,3		-1,8	-0,6	-5,1

Figure 3. *Mental health indices of patients with myocardial infarction and heart failure by NHP questionnaire and HADS subscales*

Thus, the data presented indicate a more significant response to the physical condition in heart failure group and prevalence of anxiety and depression in myocardial infarction group.

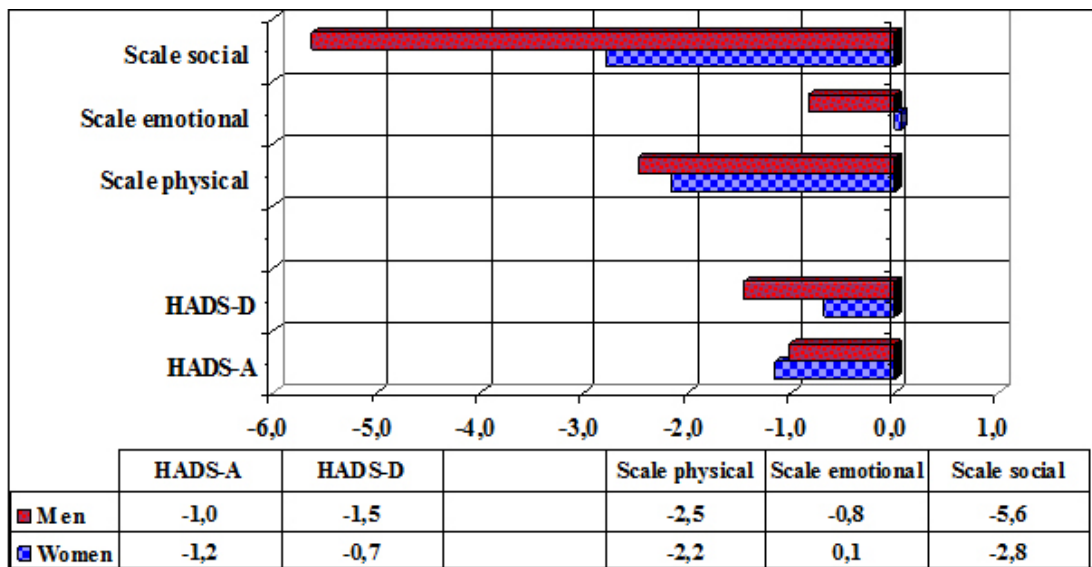|	HADS-A	HADS-D		Scale physical	Scale emotional	Scale social
■ Men	-1,0	-1,5		-2,5	-0,8	-5,6
▣ Women	-1,2	-0,7		-2,2	0,1	-2,8

Figure 4. *Mental health indices of patients with exertional angina (NHP questionnaire and HADS subscales) by gender*

Comparative characteristics of the subgroups of women and men in the group of patients with angina in terms of mental health indicators (Figure 4) showed that the social and emotional changes in men is most pronounced, and the depression level is 2 times higher than among women. In general, differences between groups are unreliable, although negative dynamics have statistically significant values, with the exception of the NHP emotional scale (regardless of gender) and depression among women.

The most significant differences were recorded between women and men of myocardial infarction group (Figure 5).
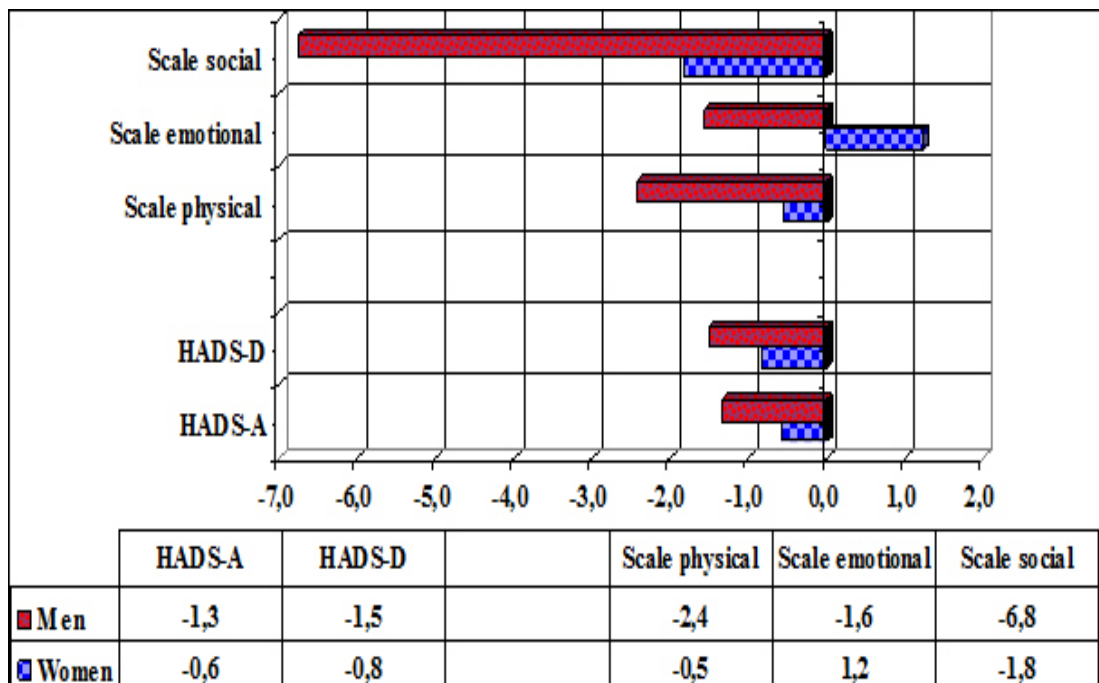

	HADS-A	HADS-D		Scale physical	Scale emotional	Scale social
■ Men	-1,3	-1,5		-2,4	-1,6	-6,8
▣ Women	-0,6	-0,8		-0,5	1,2	-1,8

Figure 5. *Mental health indices of patients with myocardial infarction (NHP questionnaire and HADS subscales) by gender*

Gender differences in myocardial infarction groups are also present: NHP social index in men is 3 times higher than that in women. NHP emotional scale in women shows noteworthy rise of values, indicating an inadequate response to the diagnosis. In men, both anxiety and depression are significantly higher than in women.

Thus, specificity of the gender reaction to myocardial infarction among women is observed, with a distinct emotional coloring. Assessing the gender characteristics of patients with heart failure in terms of mental health, prevalence of anxiety (3 times) and depression (2 times) in the female subpopulation is noted. NPA physical health index is 2 times worse among women (Figure 6).

Thus, in patients with heart failure, especially females, the mental state (both in terms of anxiety and depression) is worsening the physical status of patients.
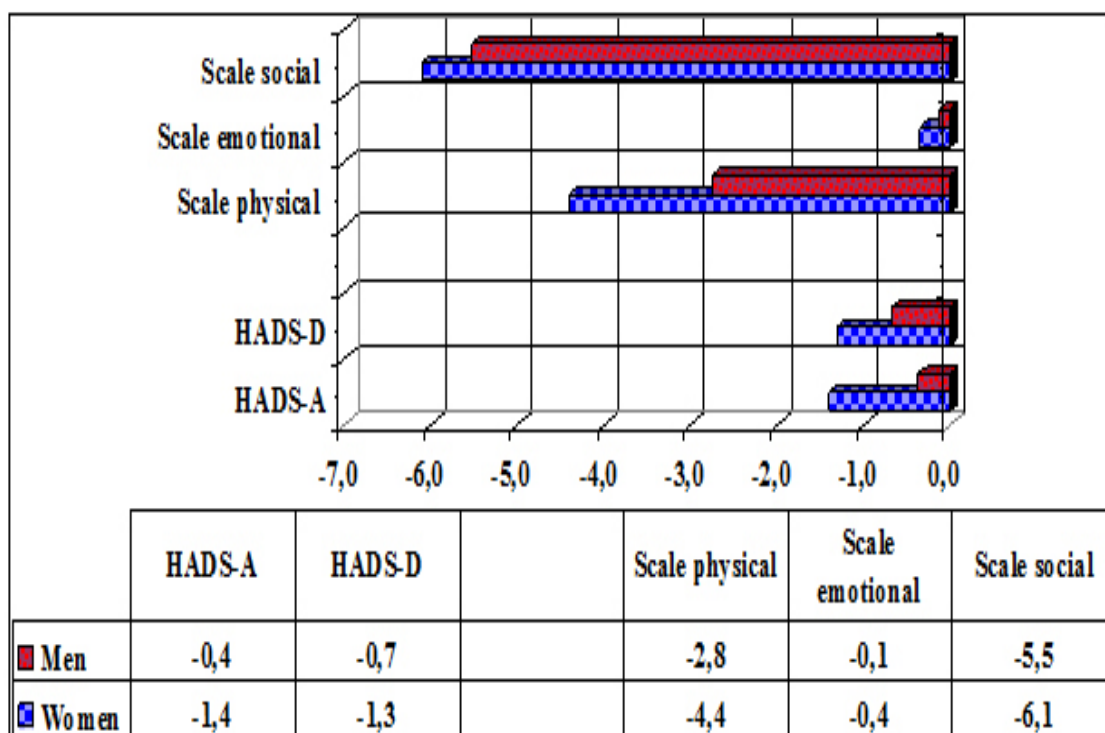

	HADS-A	HADS-D		Scale physical	Scale emotional	Scale social
■ Men	-0,4	-0,7		-2,8	-0,1	-5,5
▨ Women	-1,4	-1,3		-4,4	-0,4	-6,1

Figure 6. *Mental health indices of patients with heart falure (NHP questionnaire and HADS subscales) by gender*

To assess the possibility of anxiety and depression in patients with various CVD, extrapolation of the indicators according to the "case-control" scheme using Mantel-Haenszel odds ratio analysis was performed. The results showed that the highest chances for baseline indicators are observed in the subclinical and clinical forms of depression and long-term indicators for subclinical manifestations of depression and clinical manifestations of anxiety.

It is necessary to note the high parameters of the upper limit of the quantile range according to the initial subclinical (OR = 3.46 at 7.03 ÷ 1.62) and clinical manifestations of depression (OR = 2.58 at 6.07 ÷ 1.09) and high density of the Gauss corridor when assessing the subclinical anxiety index (OR = 1.37 at 2.78 ÷ 0.67); and in dynamics (OR = 1.37 at 2.78 ÷ 0.67). Clinical form of anxiety shows (OR = 1.23 at 2.65 ÷ 0.56) and in dynamics (OR = 1.18 at 2.58 ÷ 0.53).

Quality of life in patients with IHD and the factors exerting on its effect according to the SF-36 questionnaire, a decrease in physical functioning, reaching -8.6 (delta between 1 and 2 visit) was observed in patients regardless of the cardiological diagnosis.
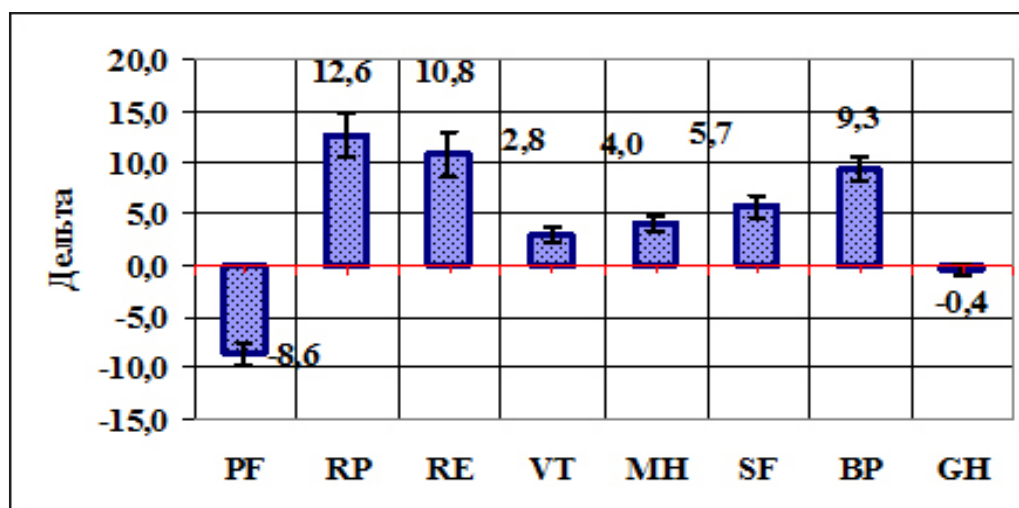
Figure 7. *Characteristics of the quality of life of patients with IHD, regardless of gender and age according to the questionnaire SF-36 (M±SD)*

Note: General Health (GH); Physical Functioning (PF); Role-Physical (RP); Role-Emotional (RE); Social Functioning (SF); Bodily Pain (BP); Vitality (VT); Mental Health (MH).

Quality of life of patients improved, especially on the effect of the physical state on role functioning (RP) and to a lesser extent the influence of the emotional state on role functioning. The characteristic of the intensity of pain and its effect on the ability to engage in daily activities, including work at home and away from home, increased somewhat in the dynamics of observation. All patients note the absence of a change in overall health at the moment and the lack of treatment prospects. In general, the GH scale remained virtually unchanged.

In general, patients of different groups noted minor changes in the physical and emotional state, usually not assessed critically.

Comparative analysis of two groups of patients with myocardial infarction and heart failure in terms of quality of life showed a more significant deterioration in the quality of life in heart failure group ($p < 0.05$ - 0.001), except for assessing the overall health of patients where differences are unreliable (Table 1).

Assessment of the patient's condition in myocardial infarction group, there were less significant differences due to a stably high error, which indicates the need for enlargement of the observation group. Double excess of physical and emotional indices in myocardial infarction group compared to patients with heart failure is noteworthy.

Table 1. *Quality of life indices in myocardial infarction and heart failure groups.*

Section	Myocardial Infarction		heart failure		Difference between groups
	M ±SD	**Dynamics**	**M±SD**	**Dynamics**	
PF	-8.7±1.9	$p < 0.001$	-10.1±2.0	$p < 0.001$	n.s.s.
RP	6.9±3.1	$p < 0.05$	14.1±4.1	$p < 0.001$	n.s.s.
RE	8.0±3.7	$p < 0.05$	9.6±3.8	$p < 0.05$	n.s.s.
VT	3.2±1.5	$p < 0.05$	3.5±1.4	$p < 0.05$	n.s.s.
MH	3.8±1.4	$p < 0.01$	4.5±1.1	$p < 0.001$	n.s.s.
SF	5.2±1.9	$p < 0.01$	7.8±2.0	$p < 0.001$	n.s.s.
BP	9.7±2.2	$p < 0.001$	8.4±2.0	$p < 0.001$	n.s.s.
GH	0.7±0.8	n.s.s.	-0.4±1.0	n.s.s.	n.s.s.

Thus, it can be noted that heart failure has a more pronounced effect on the patient's physical, emotional and social state, determining his behavioral reactions.

Assessing the subgroups of women and men with exertional angina in terms of quality of life (Figure 8, Table 2), lack of emotional state, viability, social functioning and evaluation of the general condition dynamics in women is observed; among men - similar lack of dynamics in physical state of self-assessment of mental health and evaluation of the general state of health.
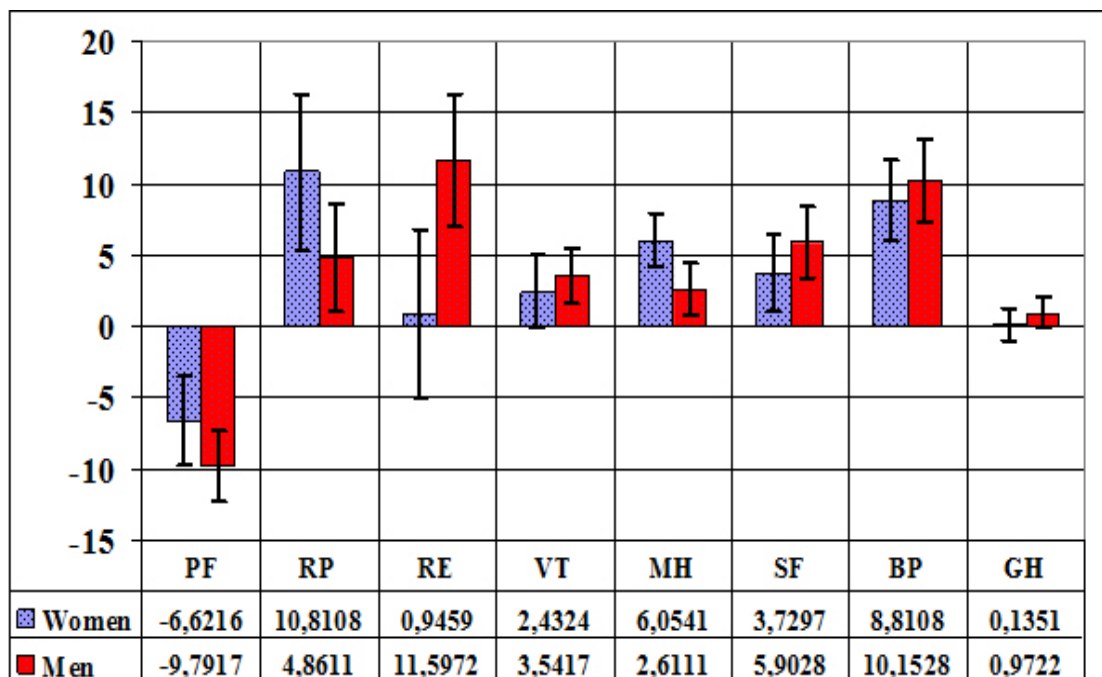

	PF	RP	RE	VT	MH	SF	BP	GH
Women	-6,6216	10,8108	0,9459	2,4324	6,0541	3,7297	8,8108	0,1351
Men	-9,7917	4,8611	11,5972	3,5417	2,6111	5,9028	10,1528	0,9722

Figure 8, Table 2. *Comparison of subgroups of women and men with exertional angina by Delta indicator*

Section	Women M±SD	Dynamics	Men M± SD	Dynamics	Difference between groups
PF	-6.6±3.1	p < 0.05	-9.8±2.5	p < 0.001	n.s.s.
RP	10.8±5.4	p < 0.1	4.9±3.8	n/d	n.s.s.
RE	0.9±5.9	n.s.s.	11.6±4.6	p < 0.05	n.s.s.
VT	2.4±2.5	n.s.s.	3.5±1.9	p < 0.1	n.s.s.
MH	6.1±1.9	p < 0.01	2.6±1.8	n.s.s.	n.s.s.
SF	3.7±2.7	n.s.s.	5.9±2.5	p < 0.05	n.s.s.
BP	8.8±2.8	p < 0.01	10.2±2.9	p < 0.001	n.s.s.
GH	0.1±1.2	n.s.s.	1.0±1.1	n.s.s.	n.s.s.

Comparison by gender revealed significantly higher rates of assessing the physical condition, self-assessment of mental health among women; higher indices of emotional state (almost 11 times), viability, social functioning and the impact of pain on the ability to engage in daily activities among men.

Thus, assessing the quality of life in excertional angina group is distinctly different by gender of patient (only assessing the impact of pain on the ability to engage in daily activities and physical functioning share common features).
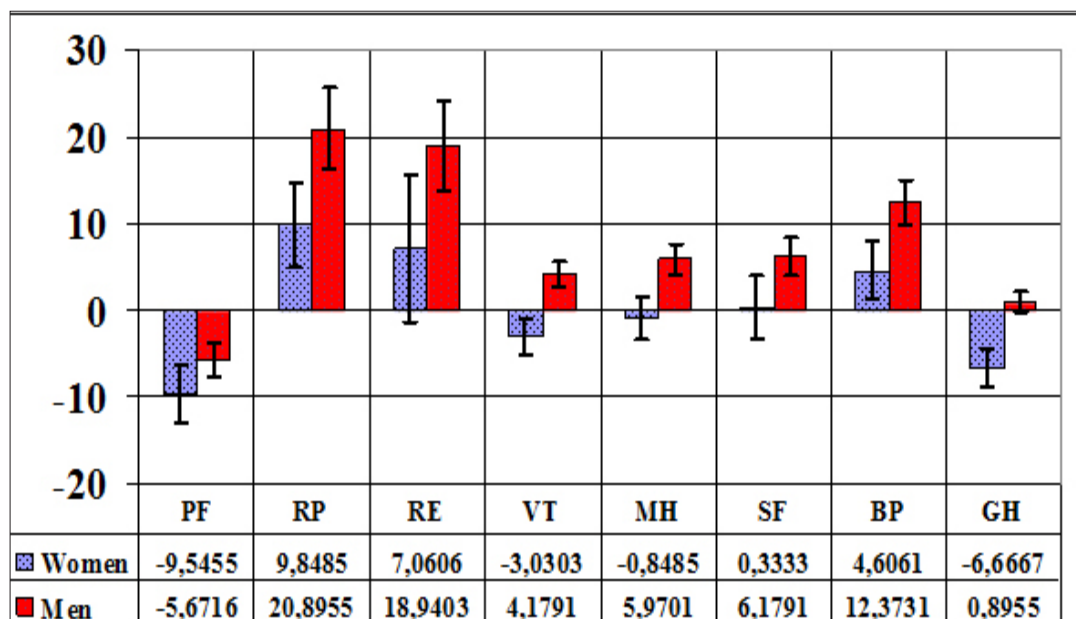
Figure 9, Table 3. *Comparison of subgroups of women and men with myocardial infarction by Delta indicator*

| Section | Women | Dynamics | Men | Dynamics | Difference between groups |
	M±SD		M± SD		
PF	-9.5±3.3	p < 0.01	-5.7±2.0	p < 0.01	n.s.s.
RP	9.8±4.9	p < 0.1	20.9±4.7	p < 0.001	n.s.s.
RE	7.1±8.4	n.s.s.	18.9±5.2	p < 0.001	n.s.s.
VT	-3.0±2.2	n.s.s.	4.2±1.5	p < 0.01	p < 0.01
MH	-0.8±2.5	n.s.s.	6.0±1.8	p < 0.01	p < 0.05
SF	0.3±3.7	n.s.s.	6.2±2.3	p < 0.01	n.s.s.
BP	4.6±3.4	n.s.s.	12.4±2.5	p < 0.001	p < 0.1
GH	-6.7±2.2	p < 0.01	0.9±1.2	n.s.s.	p < 0.01

Analyzing gender differences in myocardial infarction group by quality of life (Figure 9, Table 3), significant dynamics only in terms of physical functioning, effect of the physical state and the assessment of the general state of health in women were noted; among men there is a positive dynamics in all indicators, except for assessing the overall health status.

Gender differences between groups are marked by indicators of viability (p <0.01), self-esteem of mental health (p <0.05) and estimates of general health status (p <0.01).

The highest score is recorded in the male subgroup, where the quality of life measures 20 points in terms of the influence of the physical and emotional state, as well as the impact of pain on the ability to perform daily work. On the other scales, women scored lower values compared to the male subpopulation. Significantly lower assessment of state of health among women within 6 times in relation to men is noteworthy.

Thus, the female subpopulation is the most susceptible to a critical evaluation of myocardial infarction.

Comparative quality of life analysis in heart failure male and female subgroups reveals that there is no positive dynamics among women in assessing the emotional state, viability and social functioning and evaluation of the overall health status; among men only assessing the overall health status did not change. Comparison between gender subgroups has not revealed statistically significant differences (Figure 10, Table 4).

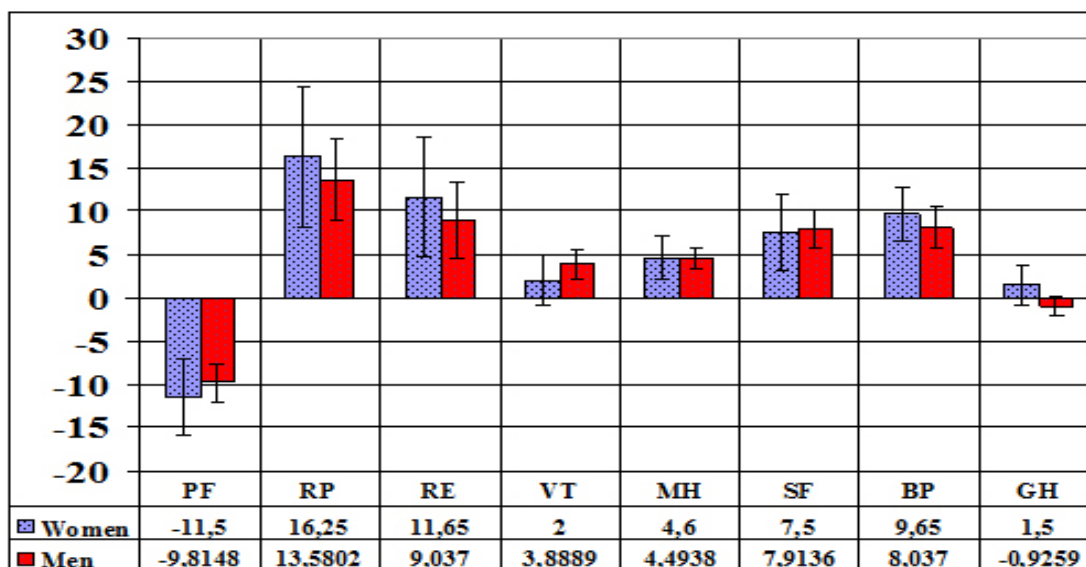The highest quality of life score is marked by the impact of physical and emotional state regardless of gender.

Figure 10, Table 4. *Comparison of subgroups of women and men with heart failure by Delta indicator*

Section	Women M±SD	Dynamics	Men M±SD	Dynamics	Difference between groups
PF	-11.5±4.4	p < 0.05	-9.8±2.2	p < 0.001	n.s.s.
RP	16.3±8.2	p < 0.1	13.6±4.7	p < 0.01	n.s.s.
RE	11.7±7.0	n.s.s.	9.0±4.4	p < 0.05	n.s.s.
VT	2.0±2.9	n.s.s.	3.9±1.7	p < 0.05	n.s.s.
MH	4.6±2.5	p < 0.1	4.5±1.2	p < 0.001	n.s.s.
SF	7.5±4.4	n.s.s.	7.9±2.2	p < 0.001	n.s.s.
BP	9.7±3.1	p < 0.01	8.0±2.4	p < 0.01	n.s.s.
GH	1.5±2.3	n.s.s.	-0.9±1.1	n.s.s.	n.s.s.

Given the above, absence of significant gender differences in assessing the quality of life in heart failure patients is noted.

Thus, only 25% of IHD patients rated their quality of life as good; 50% - as average; 25% - as bad.

The main reasons for the decline in the quality of life are:

• the need to continue treatment,

• restrictions in physical activity,

• restrictions in nutrition,

• restrictions in work,

• restrictions in leisure activity and physical training

• changes in relationships with loved ones.

Thus, the data presented indicate a significant effect of depression on the quality of life of patients with myocardial infarction, angina pectoris and heart failure.

Significant changes in the scales of both the general condition and the self-assessment of mental health in patients with IHD are noteworthy.

DISCLOSURES

All authors have not disclosed potential conflicts of interest regarding the content of this paper. The research was made in the frame of the work plan of Post Diploma Education and Polyclinic Therapy of NovSU and budget financing of city treatment and prevention institutions.

CONCLUSION

Thus, comparing the clinical and mental status of patients in clinical practice, it is necessary to revise the model of rendering assistance to cardiological patients, which includes the whole complex of measures aimed not only at eliminating the symptoms of IHD and hypertension, but also at the cause of the disease at the earliest stages of atherosclerosis development. The definition of the quality of life allows for a more complete assessment of the general condition of

patients, and its use in dynamics makes it possible to assess the results of rehabilitation and the degree of disadaptation.

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