Original Article

Clinical And Laboratory Evaluation Of The Results Of Examination Of Patients With Chronic Heart Failure Attending Health School

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Abstract

Chronic heart failure (CHF) is one of the leading public health problems, as there is a clear trend of an increase in the number of patients with CHF, as well as a high level of hospitalizations with decompensation of the disease and mortality. The article provides a clinical and laboratory assessment of a comprehensive examination of patients with this pathology to develop further medical and preventive measures.

Keywords: chronic heart failure, left ventricular ejection fraction, risk factors, clinical and laboratory assessment

Introduction

Heart failure (HF) is a severe disease that leads to hemodynamic disorders and neurohumoral dysfunctions. HF is believed to be the leading cause of morbidity and mortality among all cardiovascular diseases worldwide. So, according to some authors, there are about 22 million people worldwide with chronic heart failure (CHF). Of these, in Europe – about 6.5 million people, and in the USA - about 5 million people (2.3% of the US population over 20 years old [1, 2, 3]. CHF syndrome is characterized by high mortality, including a significant number of cases of sudden cardiac death.

With CHF, the quality of life of patients and public health indicators of the population decrease, and predictive data indicate a steady increase in these indicators. All this undoubtedly needs to transform organizational and economic strategies of healthcare in providing healthcare to the population, as well as in the search and implementation of modern technologies to improve the quality of life [4, 5,6].

Results and discussion. The group of patients who previously had a verified diagnosis of CHF, studying at the School of CHF, consisted of 198 people. Of these, there were 82 men and 117 women. The examination of patients included a clinical analysis, laboratory and instrumental diagnostics and a study of the quality of life using the developed questionnaires.

Clinical examination of patients with CHF was carried out on an outpatient basis and included a study of the

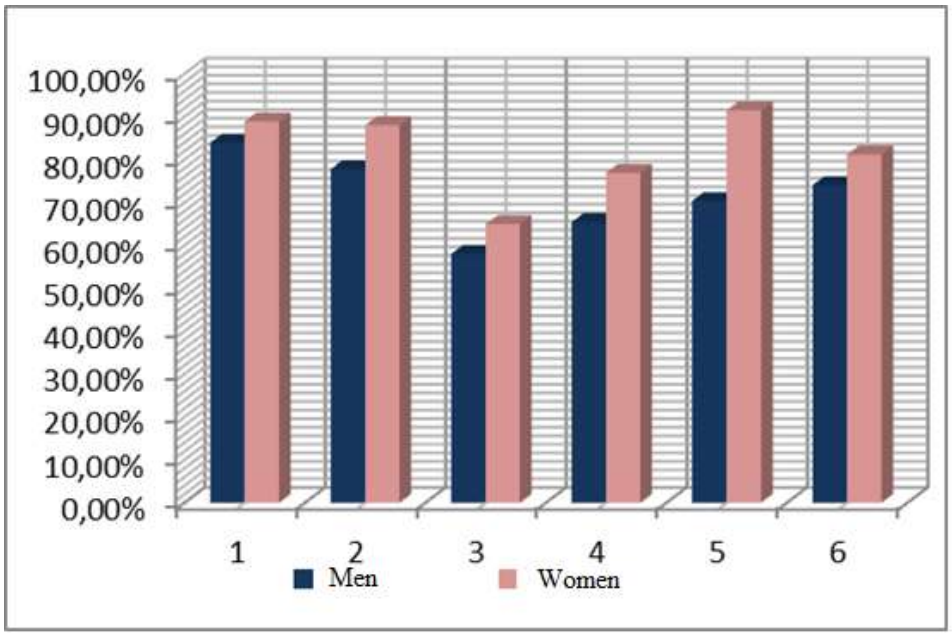
prevalence of significant complaints and anamnestic data.

It was revealed that the most common complaint of patients with CHF attending health school was shortness of breath, which bothered 68 (83.95%) men and 104 (88.89%) women. Women (103 people, 88.03%) experienced difficulty with physical activity more often than men (63 people, 77.78%). Cyanosis of the skin was noted in 47 men (58.02%) and 76 women (64.96%). Women also often felt weakness and/or fatigue (107 people, 91.45%) than men (57 people, 65.43%). Swelling and heart pain bothered men less than women (Table 1).

Table 1 - Prevalence of the main complaints of Group A patients (attending Health School)

№ п/п	Complaints	Men (n=81)		Women (n=117)	
		NE, people	%*	NE, people	**%***
1	shortness of breath	68	83,95%	104	88,89%
2	difficulty with physical exertion	63	77,78%	103	88,03%
3	blueness of any skin areas (cyanosis)	47	58,02%	76	64,96%
4	swelling	53	65,43%	90	76,92%
5	weakness and/or fatigue	57	70,37%	107	91,45%
6	heart pain	60	74,07%	95	81,20%

Note: * - percentage of the gender distribution of the number of patients in group A



Picture 1 - Gender distribution of the frequency of active complaints of patients with CHF.
Symbols: 1 - shortness of breath; 2 - difficulty with physical exertion; 3 - blueness of any skin areas (cyanosis); 4 - puffiness; 5 - weakness and/or fatigue; 6 - heart pain

Women were generally more active in complaining about CHF symptoms than men. The most significant gender difference in the frequency of complaints was found concerning symptoms such as weakness and/or fatigue, swelling and difficulty with physical exertion (21.08%, 11.49% and 10.25%, respectively, respectively, to the described complaints). Approximately equally often, both men and women were bothered by shortness of breath (Figure 1).

Statistical processing of passive complaints of the patient detected during a detailed inquiry about the state of health is not significant since the complaints were diverse, and it is not possible to establish their reliable connection with CHF and is not part of the objectives of our study.

Among all the anamnestic data, the most priority for our study was to study the duration of the underlying disease - CHF. It was revealed that in the leading group of patients suffering from CHF and attending School of CHF patients (group A), the length of the disease in most patients ranged from one to five years – only 130 people from the group (65.66%). Moreover, the duration of the disease, up to five years, was longer in men than in women and over

five years - in women. The general trend of the distribution of group A patients depending on the duration of the disease is shown in Figure 2, and a more detailed gender characteristic is shown in Table 2.

Most often, patients experienced at least one exacerbation per year - 111 (56.06%) men and women, more often women; and two exacerbations per year - 78 (39.40%) patients who made up group A more often men. Not many group A patients experienced three or more exacerbations per year, and their gender distribution was approximately the same and amounted to 4.94% and 4.54% among men and women, respectively (Table 3, Figure 3).

Table 2 - Anamnestic duration of CHF

№ п/п	Duration, years	Men (n=81)		Women (n=117)		Total (n=198)	
		NE, people	%*	NE, people	%*	NE, people	%**
1	Till 1 year	16	19,75%	21	17,95%	37	18,69%
2	1- 5 years	54	66,67%	76	64,96%	130	65,66%
3	More than 5 years	11	13,58%	20	17,09%	31	15,65%
Всего		81	100%	117	100%	198	100%

Note: * - percentage of the gender distribution of the number of patients in group A; ** - percentage of the total number of Group A (men and women)

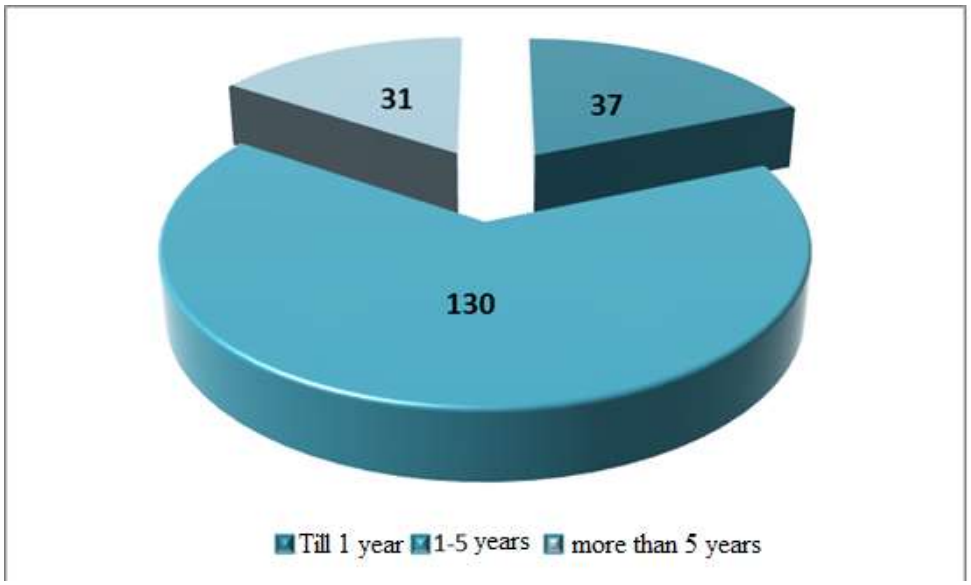


Figure 2 - Life expectancy of group A patients after the detected CHF

Table 3 - Frequency of exacerbations of CHF symptoms per year

№	**Number of times**	**Men (n=81)**		**Women (n=117)**		**Total (n=198)**	
		NE, people	**%***	**NE, people**	**%***	**NE, people**	**%****
1	1	38	46,91%	73	62,39%	111	56,06%
2	2	39	48,15%	39	33,33%	78	39,40%
3	3 and more times	4	4,94%	5	4,28%	9	4,54%
Total		81	100%	117	100%	198	100%

Note: * - percentage of the gender distribution of the number of patients in group A; ** - a percentage of the total population of group A (men and women, n=198)

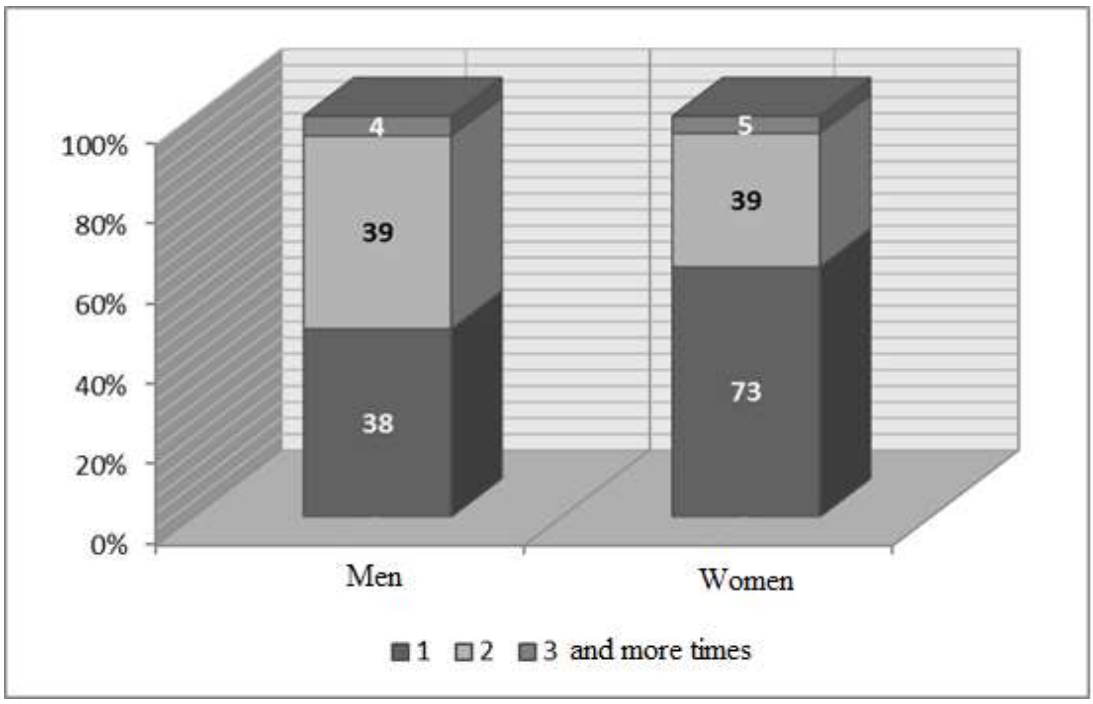


Figure 3 - Frequency of exacerbations of CHF symptoms in patients in group A

However, not all patients attending CHF School and experiencing an exacerbation of the underlying disease need inpatient correction. On average, 62.62% of patients in this group received inpatient treatment once a year and two or more times a year - 3.53% of men and women.

We also evaluated patients' feelings about the effectiveness of pharmacotherapy and the effect of the doctor's recommendations, if followed, on the well-being of patients. An equal gender percentage of patients with CHF and attending CHF School followed the doctor's advice (65.43% and 65.81% of men and women, respectively). Thus, most of the examined patients noted the effectiveness of the drugs taken that improve the prognosis of CHF. Moreover, more men (90.12%) than women (86.32%) were satisfied with their well-being after taking drugs in this group. Compliance with medications affecting the prognosis of patients with CHF and used in specific clinical situations was achieved in a more significant percentage of cases among women (71.79%) than men (45.68%). The effectiveness of drugs that do not affect the prognosis of CHF and are used to improve symptoms was more often noted by men (93.83%) than women (81.20%).

In addition, we identified the presence of concomitant pathology, the presence or absence of operations during life, whether resuscitation measures and blood transfusions were carried out, and paid attention to the allergological, hereditary and expert anamnesis (Table 4).

Table 4 - Prevalence and burden of anamnestic data of group A patients.

№	**Information from the anamnesis**	**Men (n=81)**		**Women (n=117)**	
		NE, people	**%***	**NE, people**	**%***
1	the presence of concomitant pathology	77	95,06%	113	96,58%
2	the existence of operations during the life	42	51,85%	93	79,49%
3	resuscitation and hemotransfusion in the anamnesis	68	83,95%	97	82,90%
4	burdened allergic history	51	62,96%	85	72,65%
5	burdened hereditary anamnesis	71	87,65%	101	86,32%
6	expert anamnesis (continuous work experience and /or difficult working conditions)	76	93,82%	98	83,76%

Note: * - percentage of the gender distribution of the number of patients in group A

The objective status of the study participants was assessed during physical examination under the classical principles of therapeutic and cardiological examination of a patient with CHF and other somatic pathology.

All the examined patients have been prescribed general clinical blood and urine tests and biochemical blood tests. Erythropenia, hemoglobin reduction, color index and average hemoglobin content in the erythrocyte were determined to detect anemia; the enzymes alanine aminotransferase (AlAT) and aspartate aminotransferase (AsAT), as well as bilirubin – to detect pathology liver, de Ritis coefficient - for differential diagnosis of liver and heart damage; creatinine and urea were evaluated as markers of kidney damage; electrolytes - to determine the severity of CHF. The changes in the leading indicators are presented in Table 5.

Table 5 - changes in peripheral blood parameters and biochemical blood analysis

№	**Indicator**	**Men (n=81)**		**Women (n=117)**	
		NE, people	**%***	**NE, people**	**%***
1	Erythropenia	13	16,04%	31	26,49%
2	Decrease in haemoglobin levels	14	17,28%	57	48,72%
3	Reduction of the average haemoglobin content in the erythrocyte	23	28,40%	76	64,96%
4	Increase in alanine aminotransferase (AlAT)	59	72,84%	82	70,08%
5	Increase in aspartate aminotransferase (AsAT)	46	56,79%	84	71,79%
6	The de Ritis coefficient is greater than 2	17	20,99%	24	20,51%
7	Hyperbilirubinemia	35	43,21%	71	60,68%
8	Creatininemia	27	33,33%	52	44,44%
9	Urea increase	23	28,40%	48	41,02%
10	Hypoproteinemia	31	38,27%	49	41,88%
11	Hyponatremia	2	2,47%	5	4,27%
12	Decrease in blood potassium concentration	1	1,23%	4	3,42%

Note: * - percentage of the gender distribution of the number of patients in group A

In 26.26% of group A patients (22.22% of men and 29.06% of women), proteinuria was detected in the general urine analysis, and in 17.19% (20.99% of men and 31.62% of women) - glucosuria.

The complex instrumental methods included: chest X-ray, electrocardiography, and ultrasound examination of the heart.

Radiographs of patients with CHF attending CHF School revealed cardiomegaly in 27.78% of cases, detected by the cardio-thoracic index, which was more than >50%. Venous pulmonary congestion was found in 10.38% of group A patients.

The following most common changes on the ECG were identified. According to ECG data, signs of cardiomegaly were detected in a more significant number of patients compared to chest radiography, so the sensitivity and specificity of these methods of investigation for verifying cardiomegaly are higher in ECGs.

The prevalence of typical changes detected during ultrasound examination of the heart is shown in Table 6.

Table 6 - Typical changes on EchoCG in group A patients

№	**Indicator**	**Men (n=81)**		**Women (n=117)**	
		NE, people	**%***	**NE, people**	**%***

1	Decrease in EF <45%	43	53,08%	52	44,44%
2	Violation of general and local LV contractility	57	70,37%	73	62,39%
3	LV EDD magnification >55-60 mm	65	80,24%	87	74,36%
4	Magnification of LV ESD >45 mm	73	90,12%	94	80,34%
5	Reduction of LVEF <30%	28	34,57%	46	39,32%
6	LA magnification >50 mm	19	23,45%	26	22,22%
7	Hypertrophy of LA walls >11-12 mm	23	28,39%	38	32,48%
8	Aortic stenosis	11	13,58%	14	11,97%
9	Mitral valve insufficiency	26	32,09%	31	26,49%
10	Dysfunction of the transmittal blood flow	13	16,05%	17	14,53%
11	Increase in tricuspid regurgitation rate >3 m/s	9	11,11%	12	10,26%
12	Changes in the pericardium (effusion, hemopericardium, thickening)	2	2,47%	1	0,85%
13	Reduction of the linear velocity of blood flow in the LV outflow tract <15 cm	5	6,17%	7	5,98%
14	Dilation of the inferior vena cava and reverse intraluminal blood flow	15	18,52%	8	6,83%

Thus, the revealed changes in laboratory and instrumental indicators allowed to confirm of the diagnosis of CHF in patients attending CHF School and to assess the indicators of their clinical remission, as well as the severity of the underlying disease.

Conclusion. According to the study, the most common patients with CHF who attended a Health school corresponding to the profile of the underlying disease complained of shortness of breath, weakness and/or fatigue and experienced difficulties with physical exertion. The disease, lasting from one to five years, bothered men more often than women. However, the need for correction of CHF in a hospital setting was not found in all patients. Moreover, the effectiveness of outpatient treatment with the main drugs that affect the prognosis of patients with CHF and drugs that do not affect the prognosis of patients with CHF, but are used to improve symptoms, as well as compliance with the doctor's recommendations, was at a high level with different gender orientation.

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