

Concomitant Conditions and Chronic Heart Failure

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Abstract: The prevalence of concomitant conditions such as diabetes mellitus, obesity, depression and anemia in patients with chronic heart failure in three female age groups was studied. According to the results of the study, the cause of the development of CHF was a combination of hypertension and coronary artery disease - 71.9% of cases. DM in the middle age group occurred in 18.7%, in the elderly group - in 26% ($p < 0.05$) and in the senile group in 18.4% of patients. The prevalence of obesity was the highest in the middle age group - 59.3%, 55% and 36.8% ($p < 0.05$) in other groups, respectively. In elderly women with CHF, anemia was detected in 18.8% of cases ($n=13$), in senile patients in 31.5% of cases, while in middle-aged patients the studied indicator was 15.6%. The highest proportion of depression among patients was observed in the elderly group - 60.8%, senile age was 55.2%, on average - 53.4%. The presence of comorbid conditions affects the quality of life (QL), the results of the assessment of the six-minute walk test (SMWT) and the scores on the scale of assessment of the clinical condition (SACC).

Key words: chronic heart failure, middle age, elderly, old age, anemia, depression, diabetes mellitus, obesity.

Currently, chronic heart failure (CHF) is considered as a global non-communicable pandemic, which primarily affects the elderly and senile. "CHF is not only a medical but also a social problem due to its significant prevalence, high mortality rate and high costs for the treatment of patients. CHF dramatically reduces the quality of life of patients and increases the risk of death by 4 times ... "[3]. In recent decades, modern medicine has made great advances in the treatment of cardiovascular diseases, but despite this, the prevalence of CHF continues to increase. According to world statistics, the prevalence of CHF increases with age, doubling every decade from the age of 50. At the same time, in people older than 65 years, its prevalence reaches 6-15%, while in younger people it is 2.2% [12] The high prevalence in the population and a significant impact on the quality of life of patients in the older age group indicate that many different aspects of CHF remain unresolved problems in medicine, as a result of which research in this direction continues to be relevant for modern medicine.

In recent years, the problem of cardiovascular diseases (CVD) in women has been actively discussed in cardiology. The reason for this is that, according to many observations, CVD caused by

atherosclerosis develops in female patients 8-10 years later than in male patients and the risk of complications in women of reproductive age is 3 times less, which is the reason for relatively inattentive attitude of physicians to the disease they have. At the same time, at an older age, over 65 years, the proportion of complications and deaths due to CVD and CHF, in particular, is significantly higher in women.

The aging of the body is characterized by the simultaneous development of several somatic pathologies at once, which leads to the presence of several comorbid conditions in elderly and senile patients with CHF. These most often include chronic renal failure, chronic obstructive pulmonary disease, diabetes and anemia [4, 11, and 14].

According to foreign researchers, the presence of concomitant diseases in patients with CHF contributes to a worsening of the overall prognosis and an increase in the number and duration of hospitalizations [13].

Elderly and senile age is characterized by the development of depression of heterogeneous genesis. Its course is different in that it is influenced by both biological and psychosocial factors. CVD plays a significant role in the development of depression in elderly patients. Thus, the scientific study KOMPAS (Clinical and Epidemiological Program for the Study of Depression in the Practice of General Somatic Physicians) showed that depression occurred in 60% of elderly and senile patients with CVD. Depression has a significant impact on the course of CHF in old age. It has been proven that the presence of depression significantly increases the frequency of readmissions and mortality in CHF. The work of Poroshina E.G. showed that depression is a factor in worsening CHF. This was shown during a two-year follow-up in 200 patients with CHF, in whom the presence of depression increased the mortality rate, regardless of FC and ejection fraction (EF) [6, 7].

Anemia is often associated with CHF. According to large clinical studies (ELITE II, COPERNICUS, COMET), the incidence of anemia is approximately 7-80% of people with CHF. According to some authors, in elderly patients, the development of anemia is influenced by such factors as the duration of CHF, the presence of diabetes, and creatinine clearance. On the other hand, the presence of anemia also negatively affects the course of CHF [2, 5].

Taking into account the data of scientific literature on the influence of concomitant conditions on the course of CHF, we set a goal to study the prevalence of some concomitant conditions in our study population of patients.

Methods. The study was conducted at the clinical bases of the Department of Cardiology and Gerontology of the Center for Advanced Training of Medical Workers (work in the Department of Cardiology and Therapy of the City Clinical Hospital No. 7 of Tashkent and outpatient admission of patients at the department). 139 patients with verified data of clinical and instrumental analyzes diagnosed with CHF FC II and III were under observation. The criteria for diagnosing CHF were symptoms of CHF, clinical signs and results of instrumental studies.

The inclusion of patients in the study according to the age criterion was carried out on the basis of the WHO Age Classification 2016. The mean age of all 139 patients included in the study was 67.18 ± 10.69 years. During the study, all patients were divided into 3 subgroups: group 1 - middle-aged patients ($n=32$), mean age 52.29 ± 4.24 years; group 2 - elderly patients ($n=69$), mean age 66.91 ± 4.68 years; and group 3 - group of elderly patients ($n=38$), mean age 79.81 ± 4.47 years. The group of elderly patients included 69 women with 34 cases of CHF FC II and 35 cases of CHF FC III. The group of elderly patients included 38 women with 19 cases of CHF FC II and 19 cases of CHF FC III. 32 middle-aged patients with CHF included FC II ($n=20$) and III ($n=12$).

The exclusion criteria from the main study group were:

Acute myocardial infarction (or less than 3 months after its development);

Unstable angina;

Coronary bypass surgery (within 6 months);

Hypertrophic, restrictive, obstructive or dilated cardiomyopathy;

Myocarditis, constructive pericarditis, cor pulmonale;

valvular heart disease;

Kidney or liver failure;

Acute violation of cerebral circulation (within 6 months);

Endocrine or autoimmune diseases;

Patients with joint deformities, deep arthrosis, injuries and blindness.

When patients were included in the study groups, the Classification by Functional Class (classification of the New York Heart Association (NYHA)) was used. All patients underwent a set of standard clinical, functional, laboratory and instrumental studies.

The Hamilton scale was used to assess the severity of depressive disorders (DD). The study with the help of it is carried out in the form of a questionnaire or a clinical interview. There are 21 questions in total. The total score is calculated on the first 17 questions, 9 of which are evaluated on a scale from 0 to 4, and the remaining 8 - from 0 to 2. The remaining 4 points are used to determine the type of DD.

The interpretation of the total score is carried out as follows:

- 0-7 points are considered normal;
- 8-13 points are considered mild depressive disorder;
- 14-18 points are considered a depressive disorder of moderate severity;
- 19-22 points are considered severe depressive disorder;
- More than 23 points are considered to be an extremely severe depressive disorder.

The results of the analysis of the general etiological structure of CHF in all the studied patients showed that in the majority the cause of CHF development was a combination of hypertension and coronary artery disease - 71.9%, while it is noteworthy that they were more often observed in patients with FC III. Arterial hypertension (AH) accounted for 23.7% of all cases of CHF, while isolated ischemic heart disease (IHD) led to CHF in only 4.3% of the studied patients (see Figure 1). It should be noted that the ratio of etiological factors of CHF in different age groups had significant variations.

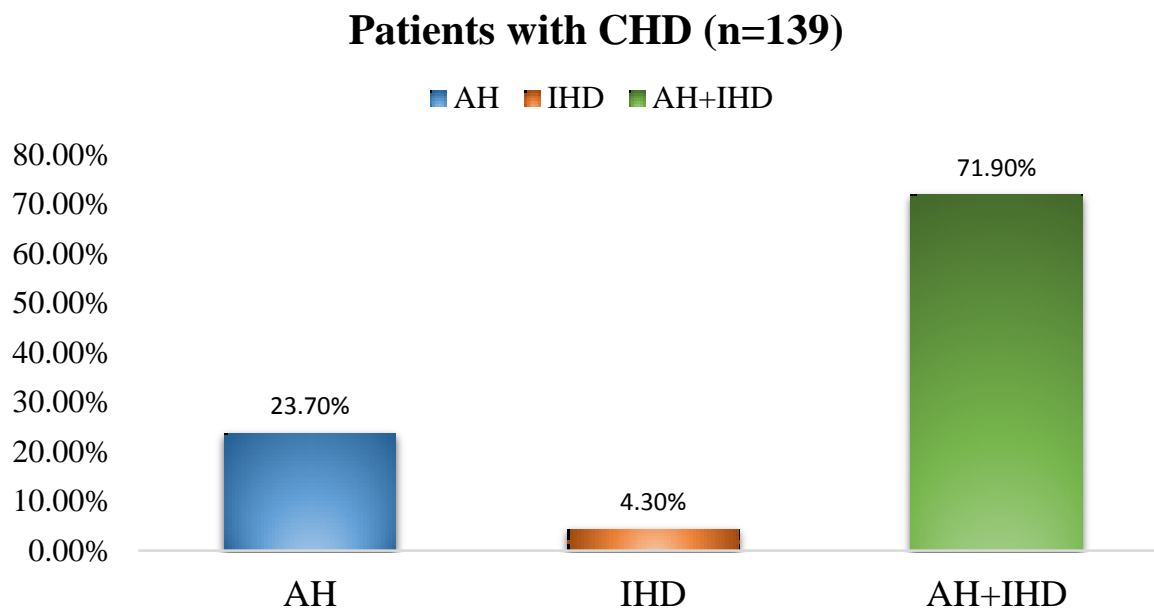


Figure 1. General etiological structure of CHF in the studied patients

It was found that diabetes mellitus (DM) in the middle age group occurred in 18.7%, in the elderly group - in 26% ($p < 0.05$) and in the senile group in 18.4% of patients. The presented graph indicates that DM occurred in approximately one in five patients with CHF (see Figure 2).

The prevalence of obesity was the highest in the middle age group - 59.3%. In the elderly group, it was slightly lower and amounted to 55%. In the senile age group, its prevalence was relatively lower and amounted to 36.8% ($p < 0.05$).

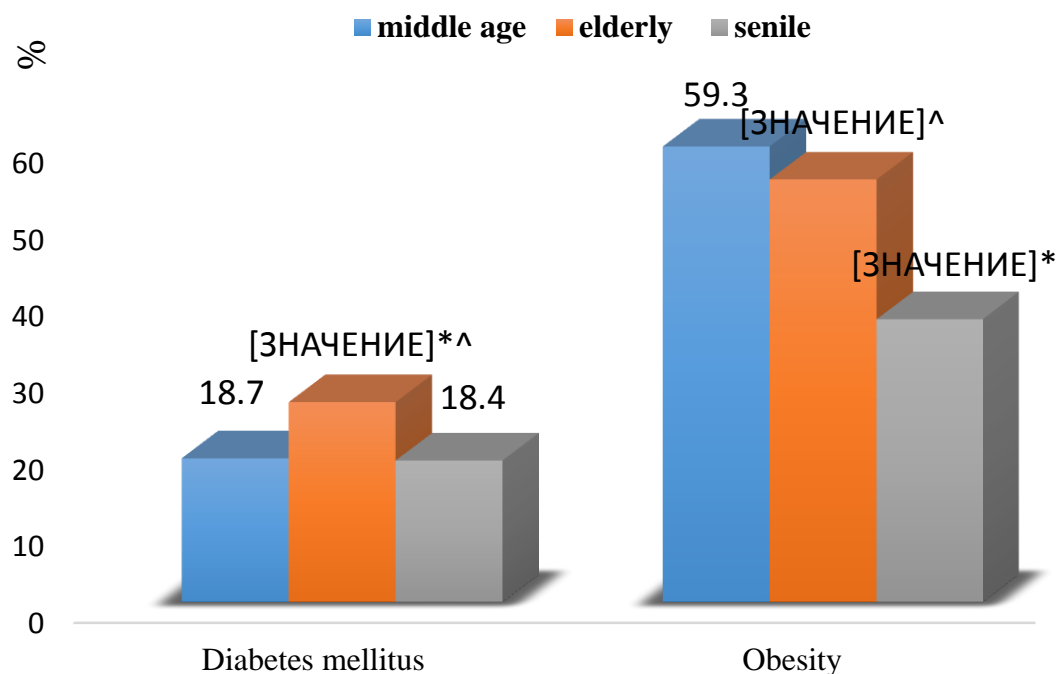


Figure 2. Prevalence of diabetes mellitus and obesity in the study groups (%)

Note: * - differences in comparison with the indicators of the middle age group are statistically significant; ^ - differences in comparison with the indicators of the senile age group are statistically significant.

The prevalence of DM in the studied age groups, depending on the FC of CHF, is shown in Figure 3. The graph shows that, in total and numerically, the highest prevalence of DM was determined in the group of elderly patients. A relatively higher incidence of DM was found in patients with FC III, which is evidence that DM is an aggravating factor in CHF. It is in patients of this age group that DM has the most pronounced effect on the course of CHF, since the number of cases of CHF with FC III in DM in this age group is 2 times more than with CHF with FC II. The low incidence of DM in elderly patients is due to the fact that the impact of its severe complications on the overall course of the disease significantly increases mortality in patients. The data obtained are consistent with the results of research by some foreign authors [8,9].

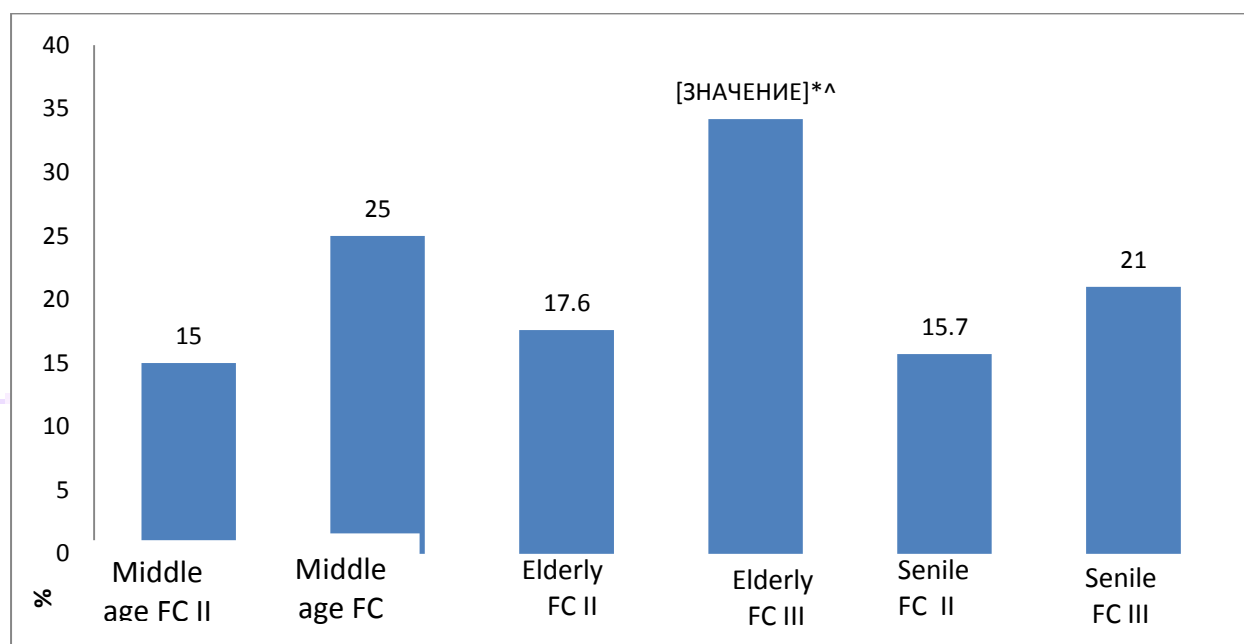


Figure 3. Prevalence among the studied patients with diabetes in the studied age groups

Note: * - differences in comparison with the indicators of the middle age group are statistically significant; ^ - differences in comparison with the indicators of the senile age group are statistically significant.

An analysis of the prevalence of obesity in patients in the study groups showed that in the middle-aged and elderly groups there was a negative correlation between the presence of obesity, its degree and FC CHF. Overall, the prevalence of obesity in FC II was significantly higher than in FC III, due to the onset of weight loss as CHF progressed (see Table 1).

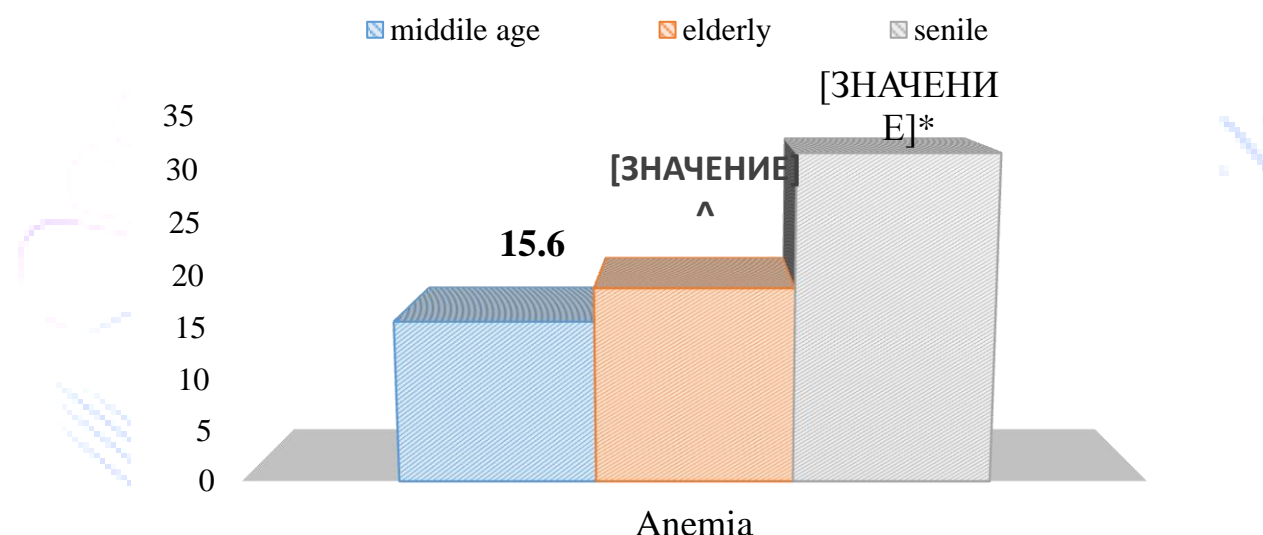
Thus, in the group of middle-aged patients with FC II, the proportion of patients with obesity of varying degrees was 65%, while in FC III it was almost 50%. A similar trend was noted in the group of elderly patients, where the proportion of obesity in FC II was 70%, while in FC III it was 40%. The smallest proportion of patients with obesity was noted in the group of patients of senile age. At the same time, patients with grade 3 obesity were not observed in this age group.

Table 1 The prevalence of obesity in patients with CHF in the study groups

Parameter	Parameter Group 1 (n=32)		Parameter Group 2 (n=69)		Parameter Group 3 (n=38)	
	FC II (n=20)	FC III (n=12)	FC II (n=34)	FC III (n=35)	FC II (n=19)	FC III (n=19)
I grade	5(25%)	4(33,3%)	13(38,2)	7(20%)	4(21%)	3(15,8%)
II grade	4(20%)	1(8,3%)	7(20,5%)	4(11,4%)	5(26,3%)	2(10,5%)
III grade	4(20%)	1(8,3%)	4(11,7%)	3(8,5%)	-	-

The results of our study showed that the incidence of anemia in the examined patients was 21.5%. Of these, mild anemia occurred in 23 women, the average hemoglobin was 99.1 ± 5.5 g/l, moderate anemia was recorded in 7 patients (the average hemoglobin was 84.8 ± 5.5 g/l.) At the same time, in elderly women with CHF, anemia was detected in 18.8% of cases (n=13), in senile patients in 31.5% of cases, while in middle-aged patients the studied indicator was 15.6% (Fig. 4).).

As can be seen from the data presented, (Table 2) the severity of anemia in patients is directly dependent on the age of women suffering from CHF.

**Picture. 4. Prevalence of anemia in study groups (%)**

Note: * - differences in comparison with the indicators of the middle age group are statistically significant; ^ - differences in comparison with the indicators of the senile age group are statistically significant.

Table 2 The prevalence of anemia by grade in patients with CHF in the studied age groups

Indeces	Group 1 (n=32)		Group 2 (n=69)		Group 3 (n=38)		P ₁₋₂	P ₁₋₃
	abc	%	abc	%	abc	%		
Anemia I grade	4	12,5	11	15,9	8	21	>0,05	>0,05
Anemia II grade	1	3,1	2	2,8	4	10,5	>0,05	>0,05

The results of our studies showed that most female patients had a high percentage of depression, which had a direct relationship with the age of women suffering from CHF.

The overall point prevalence of depression in patients with heart failure is about 21%, but figures reported in studies range from 9 to 60%. The overall prevalence among women is higher than among men: 32.7% (range 11-67%) of women have depression compared to 26.1% (7-63%) of men. The prevalence of depression increases with New York Heart Association (NYHA) functional class, with the largest difference observed between NYHA II and III [1, 10, 15].

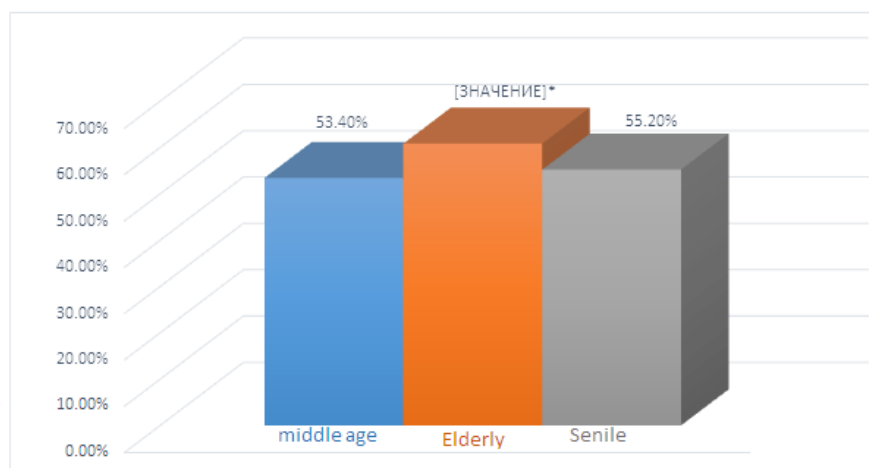


Figure 5. Prevalence of depression in patients with CHF in the study groups

Note: * - differences in comparison with the indicators of the middle age group are statistically significant; ^ - differences in comparison with the indicators of the senile age group are statistically significant.

The overall prevalence of depression is shown in Figure 5. The graph shows that the highest proportion of depression among patients was observed in the elderly group - 60.8%. In the senile age group, the prevalence of depression was 55.2%. In the middle age group, the lowest prevalence of depression was determined - 53.4%. The prevalence of depression in patients with CHF in the study groups depending on FC, shown in Figure 6, shows that the highest prevalence of depression in FC II was in elderly patients. The highest prevalence of depression in FC III was noted in the middle age group.

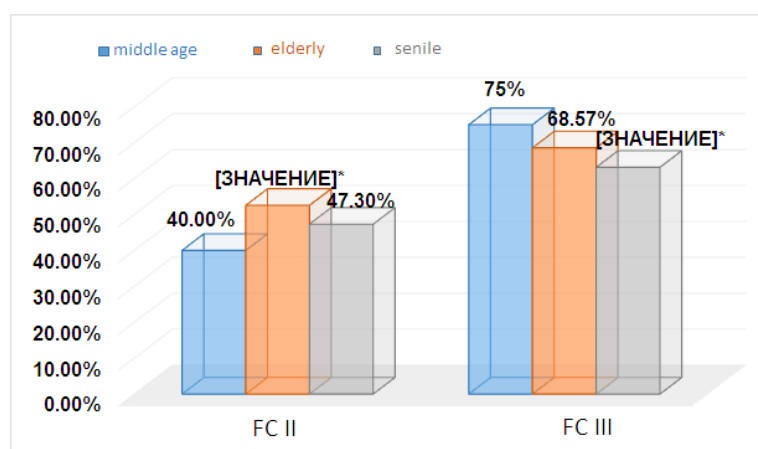


Figure 6. Prevalence of depression in patients with CHF in the study groups depending on FC

Note: * - differences in comparison with the indicators of the middle age group are statistically significant; ^ - differences in comparison with the indicators of the senile age group are statistically significant.

An analysis of the prevalence of depression depending on severity showed that there is a pronounced relationship between the degree of depression and the FC of CHF, where the severity of depression in patients was aggravated with an increase in FC (see Table 3).

Table 3 Prevalence of depression by severity

Degree of severity		Middle age n=32		Elderly age n=69		Senile age n=38	
		II	III	II	III	II	III
mild	abc	5	3	8	9	5	5
	%	25	25	23,5	25,7	26,3	26,3
medium severity	abc	2	4	9	13	3	6
	%	10	33,3	26,4	37,1	15,7	31,57
severe	abc	1	2	1	2	1	1
	%	5	16,7	2,9	5,9	5,2	5,3

The results of the HAM-D questionnaire showed that severe depression was observed more in the group of elderly and middle-aged patients. In the middle-aged group, such figures are quite explainable by the fact that some of the patients in this group were able-bodied and the development of CHF affected their routine activities, leading to a change

Таблица 4 The results of the evaluation of the correlation analysis between the severity of DD and the CHF (SMWT, QL, EF, SACC) in patients

Groups	Indeces			
	SMWT	QL	SACC	EF
Middle age HAM-D	-0,68	0,783	0,52	-0,501
Old age HAM-D	-0,29	0,718	0,416	-0,379
Senile age HAM-D	-0,345	0,731	0,467	-0,321

Thus, the presence of DR affects the physical component of QoL, which is proved by the reliable results obtained using both the MLHFQ scale and the SACC. At the same time, the influence of the severity of CHF on the mental component was revealed using HAM-D as a tool for determining DR. FC CHF according to NYHA affects the physical side of QoL, while the study subjects experience a deterioration in their mental state. From this it follows that the presence of DR in elderly and senile patients with CHF is one of the leading factors affecting QoL and the course of the disease.

Conclusion: According to the results of the study, it was found that there are features of the spread of diabetes, obesity, anemia and depression in patients with CHF, depending on age.

It should also be noted that there was a positive correlation between FC CHF and the presence of DM in the group of elderly patients. There is a negative correlation between FC CHF and the presence of obesity and its degree. Along with this, I would like to note that the incidence of depression, anemia and their degree also have a direct relationship with the age of patients suffering from CHF.

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