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Comorbid States in Patients with Chronic Heart Failure. Regional Level of the Problem (Preliminary Study)

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ABSTRACT

Purpose of the study: To study comorbid conditions in patients with heart failure living in regions with a hot climate.

Research materials: 323 patients were examined who were hospitalized in the cardiology department of Bukhara, in one of the southern and hottest regions of Uzbekistan, where the temperature of the thermometer rises above 40°C. Among the examined patients were 150 men (46.43%), 173 women (53.56%). All patients had heart failure and were divided by age into 2 groups up to 59 years old - 161 people and the second group-162 people - over 60 years old. The average age in group 1 was 52.55 + 6.42 years, the average age in group 2 was 67.56 + 6.7 years (p <0.001). CHF was diagnosed and evaluated in accordance with the recommendation of the New York Heart Society. All patients underwent general clinical and laboratory examinations, electrocardiography, and were interviewed using the Minnesota Questionnaire.

Research results and discussion: According to FC, patients were distributed as follows: I FC-26.93%; II FC-50.51%; III FC-22.29%; IV-0.26%. The average body mass index in the group under 60 years old was 29.4 + 4.9 years, in the second group over 60 years old - 28.1 (m + 4.5).
All patients had comorbid conditions. So, with one concomitant diagnosis, there were 43 patients - this amounted to 13.31% of patients, with two concomitant diagnoses of 214 patients, which amounted to 66.25%. With three concomitant pathologies - 56 patients, which amounted to 17.33% of patients. 9 patients with concomitant pathologies had 4 or more, accounting for 2.78%. On average, the total comorbidity averaged 2.1 + 0.67, in the group under 60 this indicator was 1.9 (m + 0.53), in the group over 60 years old - 2.2 + 0.75, (p <0.05). When assessing comorbidity by functional classes, it was found that in patients with 1 FC among 87 people, the comorbidity was 1.74 + 0.61, in patients with 2 FC in 164 patients it was 2.1 + 0.57 in patients with 3 FC among 72 patients comorbidity was 2.54 + 0.65. The analysis showed that with age and an increase in FC CHF, the frequency of comorbid conditions increases in parallel and is most often diagnosed in older age groups with III-FC CHF. The most common concomitant pathologies of coronary heart disease were diabetes, anemia, obesity, fatty liver disease, deforming osteoarthritis, osteochondrosis. Patients were divided into two groups depending on the hemoglobin indices of blood. In the first group, hemoglobin indices amounted to 112.4 + 10.2, in the second group hemoglobin 134.9 + 8.9 (P <0.05). The analysis showed that anemia is often diagnosed in patients with older heart failure, and the frequency increases depending on the FC disease.
In addition, in order to study renal dysfunction in heart failure, the number of patients with albuminuria and blood creatinine was analyzed. Albuminuria was detected in 24.8% of patients under the age of 60 years, then in the older age categories it occurs in 35.1% of patients (P <0.01). This confirms that with age, renal dysfunction increases in patients with heart failure. Also, in the observed group of patients, the incidence of albuminuria was studied depending on hemoglobin parameters. Moreover, in groups of patients with low hemoglobin, albuminuria was detected in 35.6% of cases, in the absence of anemia, 24.3% (P <0.05). Considering that in the Republic of Uzbekistan blood creatinine indicators are often used to determine renal dysfunction, an analysis of its level depending on age, the presence of anemia and FC CHF has been carried out. Blood creatinine in patients under 60 years old was 74.9 ± 17.7 and in 60 year olds and older 98 ± 21.9 μmol / L.
A comparative analysis of this biochemical indicator, depending on the presence of anemia, revealed the following: with hemoglobin 112.43 ± 12.0 g / l, creatinine was 119.64 ± 13.7 μmol / l and with hemoglobin 134 ± 9 g / l this indicator was equal to 89.6 ± 8.5 μmol / L (P <0.01).

Findings: CHF often occurs with comorbid conditions, among which anemia, kidney dysfunction, followed by an increase in chronic kidney disease and diabetes mellitus are most often diagnosed. The presence of renal dysfunction is confirmed by a large number of patients with proteinuria and high levels of blood creatinine. The incidence of comorbidity increases in proportion to the increase in age and FC CHF.

Keywords: comorbidity, CHF, micralbuminuria, anemia, renal dysfunction.

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INTRODUCTION

Experts of the World Health Organization consider increasing the prevalence of chronic diseases as a global epidemic of the 21st century [13, 19]. Among them, a special place is occupied by coronary heart disease (CHD) and hypertension, as the causes most often leading to chronic heart failure (CHF). It is well known that in connection with the introduction of new modern treatment and prophylactic methods as well as an increase in the proportion of elderly and older patients suffering from diseases of the cardiovascular system, the number of patients with heart failure increases every year [13, 14, 19, 20]. Currently in the world from 2 to 4% of the population suffers from chronic heart failure and five-year mortality is 45% among women and reaches 60% in men. This indicates that at present, CHF is not only a medical, but also an important socio-economic factor throughout the world. It should be noted that with an improvement in the quality of life and its duration, the proportion of coronary heart disease and hypertension and associated heart failure will certainly increase. According to the American Heart Association (ANA), CHF was named the leading cause of death in 283,000 people in 2008 and represents a new epidemic of cardiovascular disease (CVD), covering more than 23 million people worldwide, and the economic costs associated with heart failure, are estimated at billions of dollars a year. [9, 10, 15].

A characteristic feature of the modern treatment and diagnostic process in chronic diseases, including CHF, is the presence of a combination of several pathological conditions in the patient, i.e. comorbidity, which has been given special attention in recent years, and most often we are talking about comorbidity in a patient, and not with any disease [2, 16]. According to European studies, the risk of developing heart failure is especially high in the presence of both coronary heart disease (CHD) and diabetes mellitus (DM) [10, 15]. According to various researchers, the presence of high comorbidity leads to an increase in mortality in patients with a chronic disease, a decrease in the quality of life and social maladaptation [3, 6, 12, 13].

Initially, the term "comorbidity" (Latin co - "together" and morbus "disease") was proposed by Feinstein A.R. This concept characterizes the presence of an additional clinical picture that already exists or has appeared independently, in addition to the current disease and is always different from it [4,11,17].

The historical prerequisites for the definition of "comorbidity" in modern terms are found even in Ancient Chinese medicine, expressed in the harmonious coexistence of two opposite principles (Yin and Yang) in the human body. The great scientist Avicenna also mentioned more than once in his famous work "The Canon of Medical Science" about the comorbidity of the pathology of the human body, calling for "treating not the disease, but the patient".

Epidemiological data on the prevalence of comorbidity vary significantly and significantly depend on the parameters of the sample (patients of doctors and clinics, gender of patients, age, adherence of researchers to different classifications of diseases), but in general there is an increase in the frequency of comorbidity with age, mostly in women [1, 7 , eighteen]. Perhaps, along with the above factors, the mentality of the people, diet, customs and traditions, as well as the geographical place of residence play a significant role in the spread of comorbidity, which, however, cannot be categorically asserted, as this has not yet been thoroughly studied.

According to M. Fortin, based on an analysis of 980 case histories taken from the family doctor's daily practice, the prevalence of comorbidity ranges from 69% in young patients (18-44 years old) to 93% among middle-aged people (45-64 years old) 98% - in patients of the older age group (over 65 years). Moreover, the number of chronic diseases in one patient varies from 2.8 in young patients to 6.4 in older people [8, 12, 19].

The largest (92%) proportion of patients with comorbidity is detected among patients with heart failure, and the most common combinations of diseases include diabetes mellitus, coronary heart disease, anemia, as well as arterial hypertension, obesity and hyperlipidemia. At the same time, comorbidity cannot be described using several simple combinations of diseases, which also do not reflect differences in the severity of the condition, effects on the level of physiological and mental functions, and disability [5, 20].

In connection with the active introduction of modern methods of diagnosis and treatment, especially pathologies of the cardiovascular system, increasing the life expectancy of the population in the Republic of Uzbekistan, the study of comorbidity, along with other states, is becoming a priority for our country.

PURPOSE OF THE STUDY

To study comorbid conditions in patients with heart failure living in regions with a hot climate.

RESEARCH MATERIALS

We examined 323 patients who were hospitalized in the cardiology department of the multidisciplinary hospital in Bukhara. The Bukhara region is considered one of the southern and hottest regions of Uzbekistan, which has a sharply continental climate, in the summer the temperature of the thermometer rises above 40^0C. It should be added that in the vicinity of the city of Bukhara, the administrative center of the region, the famous healer Avicenna was once born and lived.

Among the examined patients were 150 men (46.43%), 173 women (53.56%). All patients had heart failure and were divided by age into 2 groups of up to 59 years — 161 people and the second group — 162 people older than 60 years. The average age in group 1 was 52.55 ± 6.42 years, the average age in group 2 was 67.56 ± 6.7 years ($p < 0.01$). CHF was diagnosed and evaluated in accordance with the recommendation of the New York Heart Society. All patients underwent general clinical and laboratory examinations, electrocardiography in 12 standard leads. In addition, patients were interviewed for the Minnesota Questionnaire.

The research results were processed by methods of variation statistics: Student t-test using the BIOSTAT software package. Numerical data are presented in the form M + SD,

where M is the arithmetic mean, SD is the mean deviation. The differences were considered statistically significant at p <0.05.

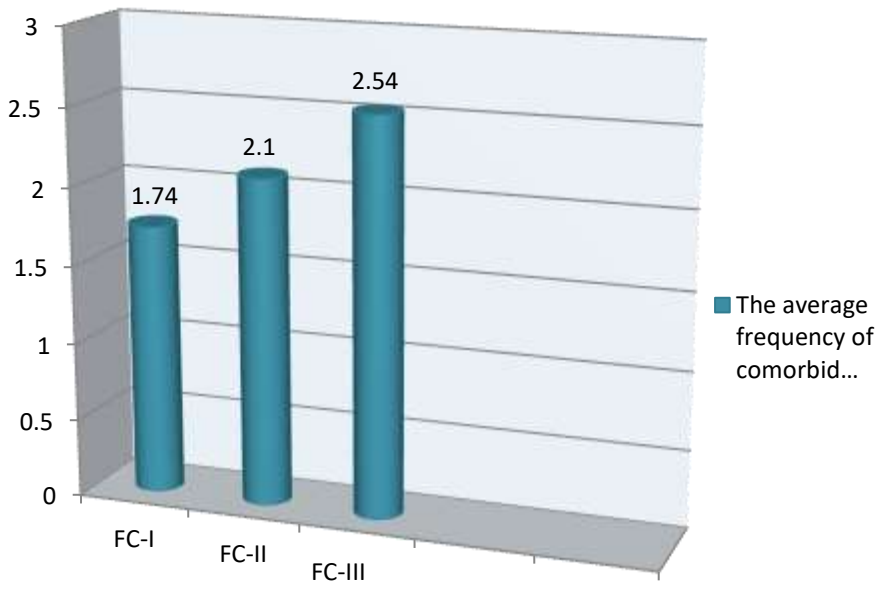
RESEARCH RESULTS AND DISCUSSION

In the process of the study, we revealed the following. According to FC, patients were distributed as follows: I FC-26.93%; II FC-50.51%; III FC-22.29%; IV-0.26%. The average body mass index in the group under 60 years old was 29.4 ± 4.9, in the second group over 60 years old - 28.1 ± 4.5.

All patients had comorbid conditions. So, with one concomitant diagnosis, there were 43 patients - this amounted to 13.31% of patients, with two concomitant diagnoses of 214 patients, which amounted to 66.25%. With three concomitant pathologies - 56 patients, which amounted to 17.33% of patients. 9 patients with concomitant pathologies had 4 or more, accounting for 2.78%. On average, the total comorbidity averaged 2.1 ± 0.67, in the group under 60 this indicator was 1.9 ± 0.53, in the group over 60 years old - 2.2 ± 0.75, (p <0.01).

When assessing comorbidity by functional classes, it was found that in patients with 1 FC among 87 people, the comorbidity was 1.74 ± 0.61, in patients with 2 FC in 164 patients it was 2.1 ± 0.57 in patients with 3 FC among 72 patients comorbidity was 2.54 ± 0.65 (Figure-1).

The analysis showed that with age and an increase in FC CHF, the frequency of comorbid conditions increases in parallel and is most often diagnosed in older age groups with III-FC CHF.



Picture 1: Indicators of the average frequency of comorbid conditions in various functional classes of chronic heart failure

The most common concomitant pathologies of coronary heart disease were diabetes, anemia, obesity, fatty liver disease, deforming osteoarthritis, osteochondrosis.

Patients were divided into two groups depending on the hemoglobin indices of blood. In the first group, hemoglobin indices amounted to 112.4 ± 10.2, in the second group, hemoglobin 134.9 ± 8.9 (P <0.05). The age of patients with anemia averaged 64 ± 10.1 years, and with normal hemoglobin indices 57.9 ± 9.1 years (P <0.05). The study of hemoglobin indices depending on FC CHF showed the following: with I-FC - 139.9 ± 16.8, with II-FC - 118.5 ± 19.7, with III-FC - 112.2 ± 14.5, with IV-FC - 102.5 ± 10.2 (P <0.05) (Figure-2).

The analysis showed that anemia is often diagnosed in patients with older heart failure, and the frequency increases depending on the FC disease.

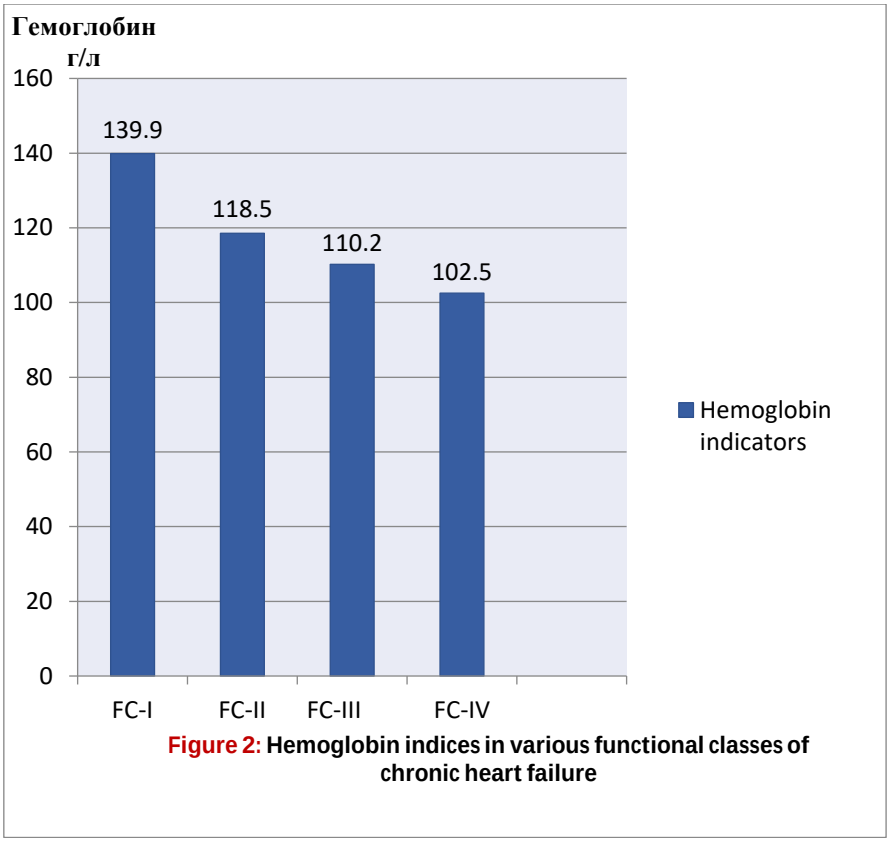


Figure 2: Hemoglobin indices in various functional classes of chronic heart failure

In addition to the above, in order to study renal dysfunction in patients with heart failure, we analyzed the number of patients with albuminuria and blood creatinine.

It is well known that the presence of albuminuria in heart failure dramatically worsens its course and there are a number of data indicating that it is one of the leading risk factors leading to mortality. Some scientific observations confirm that microalbuminuria is an earlier and more sensitive marker of renal dysfunction in patients with heart failure than blood creatinine. In this regard, we studied the incidence of albuminuria in patients with CHF examined by us, depending on age, FC, and the presence of anemia.

If albuminuria was detected in 24.8% of patients under the age of 60 years, then in the older age categories it occurs in 35.1% of patients ($P < 0.01$). This confirms that with age, renal dysfunction increases in patients with heart failure.

In 323 patients with heart failure based on FC and age, the incidence of albuminuria was studied. It was revealed that the age of patients with I-FC 54.8 ± 9.3, II-FC 54.4 ± 10.3 and III-FC 64.5 ± 9.9 years.

Analyzes showed the presence of albuminuria in patients with I-FC 12.3% of cases, II-FC 18.5% of cases, III-FC 29.1% of cases (Figure-3).

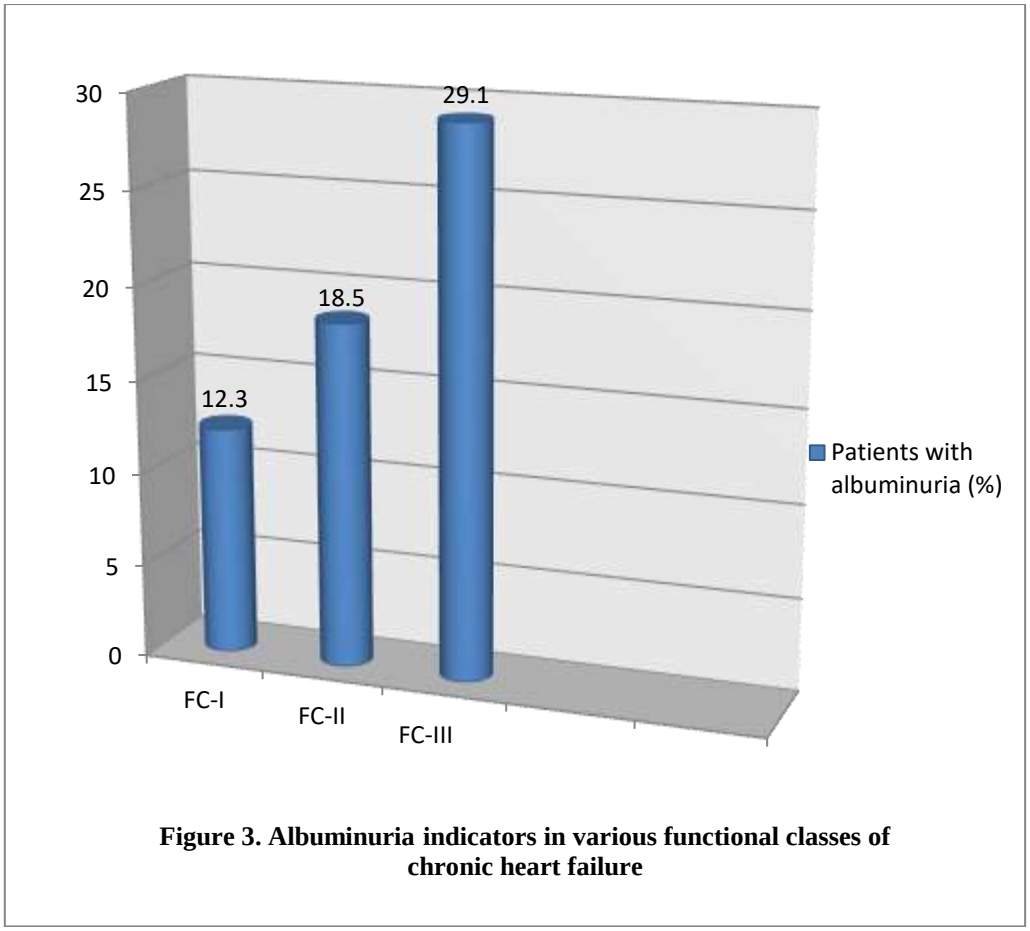


Figure 3. Albuminuria indicators in various functional classes of chronic heart failure

In patients with heart failure with increasing FC, the number of patients with albuminuria increases in parallel, which is confirmed by the available literature data.

Also, in the observed group of patients, the incidence of albuminuria was studied depending on hemoglobin parameters.

Moreover, in groups of patients with low hemoglobin, albuminuria was detected in 35.6% of cases, in the absence of anemia, 24.3% (P <0.05).

Knowing that in the Republic of Uzbekistan, blood creatinine is often used to determine renal dysfunction, we analyzed its level depending on age, the presence of anemia and FC CHF. Blood creatinine in patients under 60 years old was 74.9 ± 17.7 and in 60 year olds and older 98 ± 21.9 μmol / L (P <0.05).

A comparative analysis of this biochemical indicator, depending on the presence of anemia, revealed the following: with hemoglobin 112.43 ± 12.0 g / l, creatinine was 119.64 ± 13.7 μmol / l and with hemoglobin 134 ± 9 g / l this indicator was equal to 89.6 ± 8.5 μmol / L (P <0.01).

Based on FC, when comparing creatinine indices, it was in patients with I-FC-83.2 ± 2.8, II-FC 101 ± 3.8, III-FC 128 ± 5.4, IV-FC 138.9 ± 9 , 1 μmol / L (Figure 4).

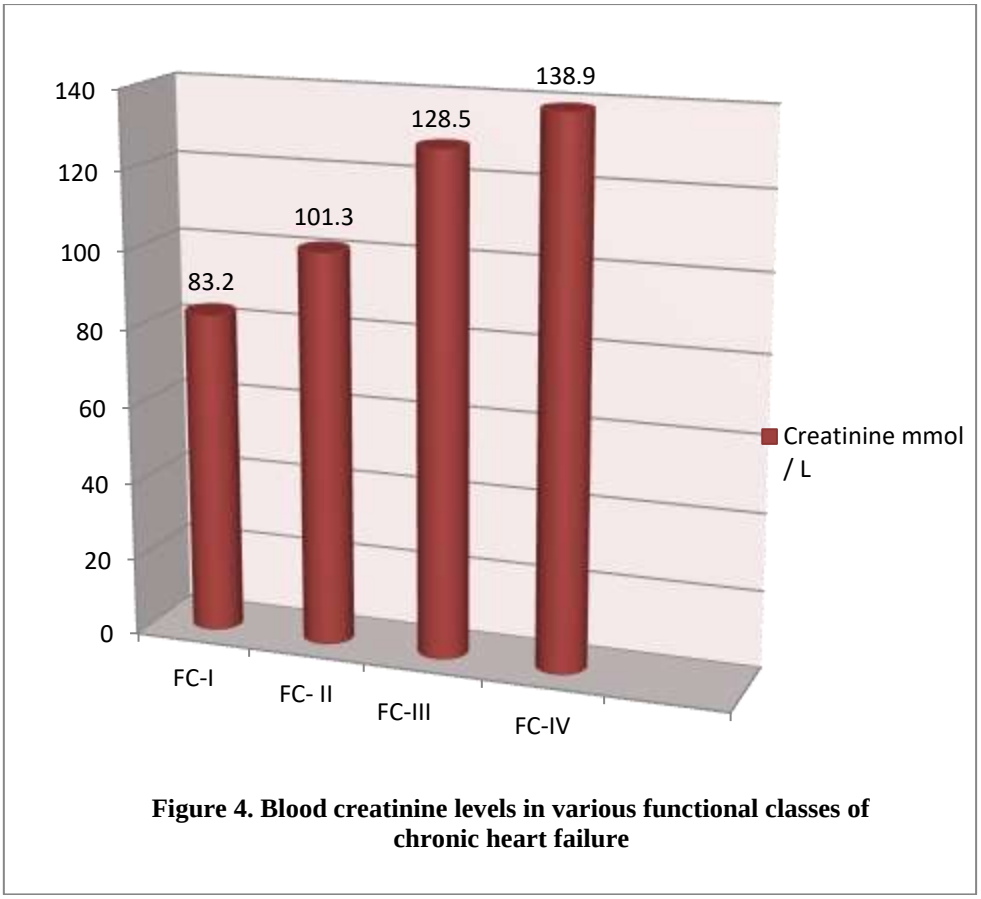


Figure 4. Blood creatinine levels in various functional classes of chronic heart failure

Analyzes of patients with heart failure showed that with increasing age and FC, creatinine levels increase in the blood, the process is aggravated in the presence of comorbid pathology, which confirms the presence of impaired renal function in a certain number of patients observed by us.

Based on our study of the frequency of occurrence of comorbid conditions in patients with CHF living in an area with a hot climate and its effect on the course of the disease, the following preliminary conclusions can be drawn.

CONCLUSION

CHF often occurs with comorbid conditions, among which anemia, dysfunction with an increase in chronic kidney disease and diabetes mellitus are most often diagnosed.

The presence of renal dysfunction is confirmed by a large number of patients with proteinuria and high levels of blood creatinine.

The incidence of comorbidity increases in proportion to the increase in age and FC CHF.

However, the study of heart failure in comorbid conditions in a hot climate in the Republic of Uzbekistan is subject to a deeper and more focused detailed study using modern diagnostic methods, taking into account the presence of anemia and renal dysfunction.

CONFLICT OF INTEREST

None

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