

Heart Failure in Health Surveillance, Early Diagnosis and Prevention Measures

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Abstract: Heart failure is a syndrome caused by decompensated dysfunction of the myocardium. It manifests itself as an increase in the volume of intercellular fluid and a decrease in the perfusion of organs and tissues. The pathophysiological basis of this syndrome is that the heart is unable to meet metabolic demands. Often develops as a complication of previous or current diseases that damage the heart muscle or place additional stress on it. We are talking about coronary heart disease, myocardial infarction and hypertension. In addition to the most common causes, there are other causes of heart failure. These include abnormal pressure in the blood vessels of the heart, diseases of the coronary arteries, heart valves and heart muscle, and arrhythmia. Sometimes heart failure is a complication of diseases of other organs, diseases that affect or damage the heart muscle. The most common cause of chronic heart failure is coronary artery disease. Heart failure can develop at any age, but is most often seen in older people.

Keywords: chronic heart failure, coronary heart disease, prevalence, mortality, left ventricular dysfunction, prevalence, shortness of breath, healthy lifestyle, prevention, physical activity, prognosis;

Relevance: Chronic heart failure (CHF) is a serious complication of heart disease, often leading to disability and death. Therefore, timely diagnosis of the development and progression of CHF is an urgent task in cardiology. Despite the progress achieved in studying the pathogenesis and treatment [1]. Chronic heart failure is a condition accompanied by a significant deterioration in the quality of life and a reduction in life expectancy. Its prevalence is quite high. According to epidemiological studies, at least 1.5% (about 3 million) of American adults suffer from chronic heart failure in the United States, and their number increases by 400 thousand every year. In Europe, according to various sources, the incidence is 0.4-2%, which corresponds to 2-10 million cases per 500 million population. The prevalence of chronic heart failure increases with age: from 1% in people 50-59 years old to 10% in people 80 years and older [2]. Due to the high level of prevalence, disability and mortality of the population, chronic heart failure attracts increased attention from therapists and cardiologists. The increase in the proportion of elderly people in most civilized countries also suggests an increase in CHF [1, 2]. Chronic heart failure is often caused by a decrease in the contractility of the left ventricular myocardium. However, in recent years, evidence has accumulated that symptoms of chronic heart failure are also observed in patients with normal left ventricular systolic function [1,3]. In most of these cases, the cause of the pathology is diastolic dysfunction of the left stomach; it is more often found in patients of older age groups, who are more sensitive to factors causing diastolic disorders - such as tachycardia, hypertension, ischemia. In addition, with age, the mass of the myocardium increases and its elastic properties deteriorate. Since in many patients the symptoms of chronic heart failure in its initial stages are not significantly expressed, it is possible to confirm the assumption of the presence of pathology and identify possible causative factors only with the help of instrumental diagnostic methods. Modern echocardiographic examination is one of the main methods for diagnosing heart failure, as it allows one to determine the dysfunction of the heart muscle and the cause of its development. An important component of echocardiography is a Doppler study, which allows assessing the diastolic function of the myocardium of the left stomach [3]. There are indications that the severity of clinical manifestations of chronic heart failure is associated with the age of patients, and in older age groups, chronic heart failure is characterized by a more severe course and more significant pathological changes in instrumental and laboratory parameters [4]. Despite advances in

therapy, the prognosis in this group of patients remains unfavorable, which requires further study of the characteristics and causes of worsening chronic heart failure. In this regard, experts from the Association for Heart Failure of the European Society of Cardiology in 2023 prepared an agreed updated position (consensus) on the definition and clinical features of chronic heart failure, summarizing the latest results on the treatment and prevention of exacerbations of heart failure [5]

The aim of the study: To study the etiology and dynamics of prevalence in chronic heart failure. Determine the importance of prevention and the impact of chronic heart failure on health. About 40 years ago, doctors first had the opportunity to influence the prognosis of a patient with chronic heart failure. [8]. With each subsequent decade, significant progress has been made in the treatment of patients with CHF both at the population and individual levels, which was primarily associated with an increase in coverage of therapy with essential drugs and changes in tactical approaches to the treatment of CHF [7, 9]. With each subsequent decade, significant progress has been made in the treatment of patients with CHF both at the population and individual levels, which was primarily associated with an increase in coverage of therapy with essential drugs and changes in tactical approaches to the treatment of CHF [6,9]. The role of the new coronavirus infection in the development of chronic heart failure requires special consideration. It is known that directly within the framework of the disease, most researchers described frequent increases in the level of troponin in the blood, mainly in severe cases of the disease. A meta-analysis showed that elevated troponin I levels in individuals with an unfavorable course or outcome (low blood oxygen saturation, intensive care unit treatment, invasive ventilation, or death) were observed in 51% of cases [5]. Accordingly, there were assumptions that in surviving patients the development of myocarditis with a probable chronic course and the formation of CHF could be expected. A meta-analysis based on materials from 11 publications in 2020 showed that in the acute period, myocarditis was observed in 36% of patients, and in the post-Covid period – in 27%. A retrospective observational study conducted primarily in the United States within the framework of the global federated medical research network TriNetX based on an analysis of electronic medical records of 718,365 patients with COVID-19 who were treated from January 20, 2020 to June 1, 2020 in various medical organizations, including academic medical centers, community hospitals, and physician practices have shown different results. New cases of myocarditis were identified in 5% of patients, new cases of pericarditis – in 1.5%. At the same time, 6-month mortality in patients with myocarditis was 3.9 and 2.9% in the control group (risk ratio 1.36; $p < 0.0001$), and in patients with pericarditis - 15.5 and 6.7% in the control group (risk ratio 2.55; $p < 0.0001$) [7]. Chronic heart failure is not an independent disease, it is a complication, the outcome of cardiac diseases that disrupt the anatomy and function of the heart. Therefore, an important task facing a doctor who suspects or diagnoses CHF in a patient is to determine its cause [8]. Currently, active measures taken to influence the most important risk factors as components of the cardiovascular continuum (hypertension, smoking, hypercholesterolemia) have led to a decrease in the incidence of coronary artery disease and its more benign course; The widespread introduction of reperfusion therapy for myocardial infarction at the end of the twentieth century significantly improved the prognosis of these patients. Patients with coronary artery disease survive and develop CHF later in their illness. Thus, the aging of the general population in general and patients with CHF in particular, improved early diagnosis and improved treatment methods for coronary artery disease, dilated cardiomyopathy and valvular heart disease are the objective reasons for the increase in the prevalence of CHF [4,9].

Materials and research methods: The study group consisted of 98 patients (76 men and 22 women) aged from 25 to 72 years (mean age 59.4 ± 1.29 years). The factors were studied through family clinics. The total number of patients examined was divided into subgroups of young (18-44 years) (23 patients), middle-aged (45-59 years) (29 patients) and elderly (60-74 years) age (46 patients) in accordance with the recommendations WHO. In order to obtain a general picture of the state of health, the examination used an echocardiographic study, a 6-minute walk test, and determination of the level of NT-proBNP in the blood plasma.

Research results: During the observation period, the incidence of the main symptoms of CHF (tachycardia, edema, shortness of breath, weakness) tended to decrease, while the prevalence of

cardiovascular diseases increased statistically significantly. The main causes of CHF remain arterial hypertension and coronary heart disease; There has been an increase in the role of myocardial infarction and diabetes mellitus as causes of CHF. During the analyzed period of time, the number of patients with reduced EF (<32%) was significantly lower among young patients, while those with preserved EF were significantly higher among elderly patients. Among patients with CHF in older age groups, there was a greater number of patients with signs of pulmonary hypertension (high values of systolic pressure in the pulmonary artery (SPAP)). The average distance walked during a 6-minute walk was relatively shorter in older patients, as well as a greater number of patients with higher functional classes (FC) III-IV. Number of patients with elevated blood levels of NT-proBNP, as well as the mean NT-proBNP level were also comparatively higher in older age groups. The main reasons for the decline in overall health are external and internal environmental factors that negatively affect health and also influence the development of various diseases. Physical education classes alone are not capable of increasing the level of physical development and health of the population. It is also necessary to lead a healthy lifestyle to maintain a normal body. The study showed that in men with hypertension and EF, more than 50% of symptoms, mainly shortness of breath and fatigue, are closely related to the presence of signs of diastolic dysfunction. In women, this relationship was much less strong due to the fact that non-cardiac causes of symptoms, and primarily excess body weight, were of great importance. The prevalence of clinically manifest CHF in the population is at least 1.8-2%; among people over 65 years of age, the frequency of CHF increases to 6-10%. In elderly patients, this is the most common diagnosis made when visiting a doctor, while decompensation of CHF becomes the most common reason for hospitalization in elderly patients.

Conclusions: The disadvantage of the known prototype method for early diagnosis of the development of CHF is that the technique is expensive, time-consuming, and difficult to implement, since it requires complex and costly preliminary preparation of blood serum using expensive reagents [1,5]. Carrying out a Doppler examination of LVDD and the search for unified criteria for its assessment, in our opinion, is of great practical importance for the timely diagnosis of CHF, and, therefore, allows timely initiation of therapy, thereby improving the prognosis of the disease in this group of patients [3]. Summarizing the above, it should be noted that modern trends in the formation of a value-based attitude to health differ in their focus; it is necessary to develop approaches to earlier and more accurate diagnosis of CHF with the subsequent implementation of programs to prevent the progression of CHF at the population level. The effectiveness of monitoring the management of a patient with CHF and the accurate implementation of the National Clinical Guidelines for the Treatment of Heart Failure is only possible by creating a register of patients with cardiovascular pathology and analyzing mortality at each therapeutic site. All this will significantly influence mortality and increase life expectancy of the population. [10]. Thus, the clinical course of CHF is characterized by a more severe course in elderly patients, despite the predominance of patients with preserved EF, which is confirmed by the more frequent occurrence of FC III-IV, clinical, instrumental and laboratory indicators, and is associated, at least partially, with a more frequent occurrence of comorbid pathology. In conclusion of the article, I would like to emphasize that a healthy lifestyle is an important component of a fulfilling life in a rapidly changing world. Managing a patient with CHF is not an easy task, but it can be done if you have a good knowledge of clinical recommendations. Improving the prognosis and quality of life of such patients is possible through the interaction of inpatient doctors, who often deal with decompensation of CHF, and outpatient doctors, who bear the burden of long-term care for patients and prevention of decompensation. [8]. It is important to detect diseases in a timely manner, which creates conditions for their effective treatment. All over the world, there is an increase in anxiety and depression, the risk of which is directly related to socio-psychological factors. The goal is to reduce morbidity and preventable mortality from diseases, increase healthy life expectancy due to the proportion of people leading a healthy lifestyle [9,10]. It is important to remember that health is an invaluable asset not only for each person, but for the entire society. That is why prevention of a healthy lifestyle is no less important than promotion. [7,10]. Prevention and treatment of the main risk factors for CHF, especially at the outpatient stage, as the cause of the development of cardiac decompensation, are a priority.

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