Diagnosis and Treatment of Chronic Heart Failure in Diabetes of the 2nd Type

M.S. Kultayev, A.Zh. Yesirkepova, A.B. Abdugulova, A.B. Abdykulova and B.Zh. Kanseitova

National Medical University, S. Asfendiyarov, Kazakhstan

Abstract: Chronic heart failure (CHF) is an acute medical and social problem relating to the priorities of the national health systems of most countries of the world due to the increasing spread of this syndrome, despite the continuous improvement of treatment. The near future promises only the worsening of the problem: the incidence and prevalence of CHF increases due to the increase in life expectancy.

Thus, the need to clarify the features of the diagnosis of CHF in patients with diabetes mellitus and the improvement of their therapy is beyond doubt.

The aim of this research is to clarify the frequency of chronic heart failure in patients with diabetes type 2 in the specialized department of the hospital and the unorganized urban population, to assess the adequacy of its diagnosis and treatment.

To achieve this goal, the following tasks:

1. To identify the prevalence of chronic heart failure in patients with diabetes type 2.

2. To assess the level of diagnosis of chronic heart failure in patients with diabetes type 2.

3. To analyze the state of drug therapy in patients with diabetes type 2 in the presence of chronic heart failure.

For the first time, the prevalence of CHF in patients with diabetes type 2 mellitus in an unorganized urban population studied.

Keywords: Diagnosis, treatment, chronic heart failure, diabetes, quality of life, increasing.

INTRODUCTION

Chronic heart failure (CHF) is one of the most common and prognostically unfavorable diseases of the cardiovascular system. Despite significant advances in the prevention and treatment of chronic heart failure, this disease remains a very urgent problem of cardiology. This reveals a steady increase in the prevalence of CHF [1]. Diabetes mellitus (DM) significantly increases the risk of developing cardiovascular diseases. According to many epidemiological studies, cardiovascular diseases cause 75% of people with diabetes to die [2]. Diabetes is the cause of direct damage to the heart muscle, which leads to dysfunction of the left ventricle and the development of heart failure.

Type 2 diabetes worldwide has reached epidemic levels. Currently, there are more than 150 million patients with type 2 diabetes in the world and its annual increase is 5-10% [3]. The combination of type 2 DM and CHF is a common syndrome [4]. Epidemiological studies indicate that 15 to 26% of patients with CHF suffer from type 2 diabetes mellitus [5]. About 12% of patients with type 2 diabetes mellitus have signs of CHF [6]. Especially unfavorable prognosis when combining these two diseases that have a mutually reinforcing negative impact on the functional state of the cardiovascular system and target organs.

The prognosis and outcome of CHF is greatly influenced by the functional state of the heart [7]. The heart is a target organ in CHF and in diabetes mellitus. Heart damage in type 2 diabetes develops in 30-60% of patients. At the same time, interest in studying cardiorenal relationships in type 2 diabetes mellitus has increased in recent years [8]. The mechanisms of development of cardiorenal syndrome in patients with type 2 diabetes are complex and diverse. They are based on a violation of insulin sensitivity (insulin resistance), which leads to a cascade of metabolic and hemodynamic changes, leading to severe, sometimes irreversible damage cardiovascular system in these patients [9].

Thus, it seems relevant to study the characteristics of cardiorenal syndrome, as well as the development of optimization of the treatment of patients with CHF in combination with type 2 diabetes considering cardiorenal interrelations.

Address correspondence to this article at the Kazakh State National University of al-Farabi, Almaty, Kazakhstan; Tel: +77073851878;
E-mail: zhanat_2006@mail.ru

ISSN: 2223-3806 / E-ISSN: 1927-5951/19

Active targeted detection of CHF syndrome among such patients leads to additional diagnostics of it in more than 15% of cases, along with the elimination of over diagnosis in 5% of patients.

The dramatic nature of the epidemiological disaster situation aggravated by an unfavorable prognosis and high disability in patients with CHF.

Among the main causes of CHF, diabetes mellitus (DM) divides the third to fourth place with chronic obstructive pulmonary disease (COPD) after arterial hypertension and ischemic heart disease. In the presence of diabetes, the relative risk of death from cardiovascular diseases is 2.8-13.3 times higher than that of people without diabetes. At the same time, one should not forget about the possibility of specific diabetic myocardial damage, often called "diabetic cardiomyopathy", which already in the early stages of glucose metabolic disturbances may be accompanied by worsening systolic and, more often, left ventricular (LV) diastolic function.

However, the frequency of CHF in patients with diabetes mellitus is much higher than would be expected with a random combination of arterial hypertension and coronary heart disease. At the same time, the true frequency of CHF in diabetic patients in our country not known, and its detection remains unsatisfactory even in a specialized hospital.

Currently, there are no recommendations on the features of detecting early signs of CHF in patients with diabetes mellitus. And they are necessary, considering that in diabetes mellitus 2-type (more than 85% of all patients with diabetes), the overwhelming number of patients are overweight and obesity, which can affect the validity of the 6-minute walk test and scale clinical state assessment.

RESULTS

The results of the study dictate the need actively identify the initial manifestations of CHF in patients with type 2 diabetes, primarily in the presence of insulin dependence, overweight and obesity, hypertension, coronary heart disease, and combinations thereof. Optimization of therapy for such patients will contribute to a longer retention of their efficiency and longevity.

1. Chronic heart failure detected in the vast majority of patients with type 2 diabetes.

2. Clinical and instrumental manifestations of comorbid cardiovascular and metabolic pathologies make it difficult to diagnose the early stages of chronic heart failure in patients with type 2 diabetes according to generally accepted criteria, and therefore. It is necessary to include the 6-minute walk test, the results of which should interpreted taking into account the age and body mass index of patients, not only to assess the severity of chronic heart failure, but also to establish its presence.

3. Drug therapy of patients with type 2 diabetes mellitus complicated by chronic heart failure requires optimization: increasing the frequency of prescribing an ACE inhibitor or saran, modern blockers and statins.

DISCUSSION

Chronic heart failure combined with type 2 diabetes in the vast majority of patients: in 88.3% among men and 73.3% of women hospitalized in the endocrinological hospital and in 87.0% and 81.0% respectively among patients in the urban registry.

Active, targeted detection of chronic heart failure contributes to the diagnosis of 15% of new cases of this syndrome in a population of patients with type 2 diabetes. The main causes and risk factors for heart failure in this population are arterial hypertension, coronary heart disease and their combination, overweight and obesity, secondary insulin dependence. In identifying chronic heart failure among patients with diabetes, apart from the analysis of clinical and instrumental pathognomonic indicators, it is necessary to conduct a 6-minute walk test, the results of which should interpreted taking into account the gender factor, age and body mass index of patients.

Fundamental gender differences in the frequency of chronic heart failure syndrome and the risk factors for its development in the population of patients with type 2 diabetes mellitus could not identified.

In the treatment of comorbid pathology of the cardiovascular system in patients with type 2 diabetes mellitus, an increase in the frequency of prescription of ACE inhibitors or Spartans, beta is adrenergic receptor blockers and statins is necessary.

The results of the study indicate the importance of identifying in patients with CHF with concomitant type 2 diabetes who have had a myocardial infarction early signs of kidney damage (MAU and reduced GFR) for the timely correction of therapy. The obtained data

allows us to optimize the choice of therapy in patients with CHF and type 2 diabetes. The revealed nephroprotective effect of carvedilol makes it possible to position it as a drug of choice in patients with chronic heart failure with concomitant type 2 diabetes mellitus in the early post-infarction period in the event of impaired renal function. The established data on the beneficial effects of mildronate on quality of life, carbohydrate and lipid exchanges give reason to recommend the prescription of mildronate as part of basic therapy in patients with CHF and concomitant type 2 diabetes.

1. In the group of patients with CHF with concomitant type 2 diabetes, compared with patients with isolated CHF, concentric and eccentric types of left ventricular hypertrophy prevail. Also in this category of patients, disturbances of the diastolic function of the heart are significantly more common.

2. Patients with CHF and type 2 diabetes, as compared with patients with isolated CHF, have more pronounced impairment of the functional state of the kidneys, characterized by a decrease in GFR, IDF and an increase in the average level of MAU.

3. It has been established that in patients with CHF and type 2 diabetes, compared with patients with isolated CHF, the tone of the sympathetic section of the autonomic nervous system is more significantly increased, the overall power of HRV is significantly reduced, mainly in the high and low frequency oscillations.

4. Among patients with CHF with concomitant type 2 diabetes, a significantly more pronounced decrease in the quality of life was found compared with patients with isolated CHF.

5. Cardiorenal relationships were established in patients with CHF and concomitant type 2 diabetes: correlation interactions were found between the morphofunctional parameters of the heart, HRV, QOL and the functional state of the kidneys.

6. 16-week therapy with carvedilol compared with bisoprolol as part of basic therapy in patients with CHF and concomitant type 2 diabetes has a more significant positive effect on the morphofunctional parameters of the heart and HRV, nephroprotective effects, and also improves lipid metabolism.

7. Inclusion in the treatment regimen of mildronate in patients with chronic heart failure with concomitant type 2 diabetes improves heart rate variability, morphofunctional parameters of the heart, QL, has an additional nephroprotective effect, reduces the average values of TG and VLDL, as well as the level of glycated hemoglobin, compared with basic therapy.

CONCLUSION

Coming up to conclusion we are giving practical recommendations in conducting the treatment and working with the patients with pathology.

1. In patients with type 2 diabetes mellitus, active targeted detection of the CHF syndrome is necessary, first, in the presence of hypertension, coronary heart disease and their combination, especially with overweight and obesity, secondary insulin dependence.

2. Along with clinical and anamnestic pathognomonic data, indicators of systolic and diastolic functions of the left ventricle, it is necessary to conduct a 6-minute walk test, the results of which are analyzed taking into account gender, age characteristics of patients and BMI, primarily indicate the presence of CHF without detailing its degree expressiveness.

3. Treatment of patients with type 2 diabetes complicated by CHF should not only be aimed at achieving sustainable compensation of carbohydrate metabolism, but also fully comply with modern approaches to the medical treatment of circulatory failure, especially in the frequency of prescribing ACE inhibitors / Spartans, P-blockers and statins.

REFERENCES

[1] Avdeev SN, Baymakanova GE. Strategy for managing a cardiological patient with COPD. Cardio is pulmonary relationship. Heart 2007; 6(6): 305-309.

[2] Ageev FT, Ovchinnikov AG. Diastolic dysfunction as manifestations of cardiac remodeling. Heart Failure Journal 2002; 3: 190-195.

[3] Ageev FT. Diastolic Heart Failure: 10 years dating. Journal of Heart Failure 2010; 11(1): 69-76.

[4] Aleksandrov AA, Shatskaya OA, Kukharenko SS, Drozdova EH, Bondarenko IZ, Tabidze ND, Shestakova MV. Heart failure, diabetes, beta is blockers and the risk of hypoglycemia. RFK Journal 2008; 3(4): 47-51. https://doi.org/10.20996/1819-6446-2008-4-3-47-51

[5] Alexandrov AA. Heart damage in endocrine diseases. The appendix on the CD to the national manual Cardiology. ed. Yu.N. Belenkova, R.G.Oganova. M.: GEOTAR is Media, 2007; pp. 12-32.

[6] Aleksandrov AA. Diabetic heart: fight for mitochondria. Cons Ilium Medium 2003; 5(9): 50,95,13.

[7] Aleksandrov AA. Metformin and cardiovascular complications of diabetes: "reflections at the main entrance." BCM-2008. T.16, №11. p. 1544-1548.

[8] Yu. Aronov DM. Treatment and prevention of atherosclerosis. M.; Triad-X, 2000; p. 411.

[9] Aronov DM, Lupanov VP. Functional tests in cardiology. M.: MED press Inform 2007; p. 326.

[10] Arutyunov GP. Diabetes mellitus and atherosclerosis. What is the optimal strategy for containing the atherosclerotic process? A Heart 2004; 1: 36-40.

[11] Atroshchenko ES. A patient with chronic heart failure and preserved left ventricular systolic function. Journal of Heart Failure 2007; 8(6): 297-300.

[12] Atroshchenko ES. Heart failure in patients with type 2 diabetes: problems and solutions. Journal of Heart Failure. 2008; 9(6): 300-303.

[13] Atroshchenko ES, Kadochnikov NG, Solovey SP. Cardiovascular risk factors in women and men with type 2 diabetes who are hospitalized in a hospital. Journal of Women's Health Problems 2010; 5(1): 29-34.

[14] Beytuganov AA, Rylova AK. The incidence of type 2 diabetes in patients with CHF. Journal of Heart Failure 2005; 5(6): 114-116.

[15] Belenkov YuN, Mareev VYu. Principles of rational treatment of heart failure. M.: Media Medical 2000; p. 266.

[16] Belenkov YuN, Mareev VYu. Cardiovascular continuum. Journal of Heart Failure 2002; 3(2): 7-11.

[17] Borovikov VL. Popular introduction to the program STATISTICA. M.: Computer Press 2008; p. 267.

[18] Gilyarovsky SR. Metabolic approaches to the treatment of CHF. Journal of Heart Failure 2008; 10(2): 11,51,22.

[19] Glantz S. Biomedical statistics. M.: Practice, 2008; p. 459.

[20] Gorokhova SG. Coenzyme Q10 in adjuvant treatment of cardiovascular diseases. Breast Cancer 2008; 16(11): 15581560.

Received on 15-02-2019 Accepted on 10-03-2019 Published on 14-03-2019

DOI: https://doi.org/10.29169/1927-5951.2019.09.02.10