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PROGRESSIVE HEART FAILURE

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Abstract
The article presents the problems of progressive heart failure (PHF) and despite significant, it would not be an exaggeration to say revolutionary, achievements in clinical pharmacology, cardiac surgery and implantation arrhythmology, the number of patients with chronic heart failure (CHF) is not decreasing in many countries, and in some, for example, in Uzbekistan, it is increasing. At the same time, unfortunately, the immediate and long-term results of the so-called optimal CHF therapy are often disappointing for both the patient and the doctor. In 2007 Experts from the Association of Heart Failure of the European Society of Cardiology have proposed the term PHF to refer to CHF, in which optimal drug therapy, as well as cardiac resynchronization therapy, are not effective. The article discusses the issues of terminology, diagnosis, prognostic stratification and routing of patients with PHF, as well as short- and long-term treatment strategies for these patients.

Keywords: progressive heart failure, definition, indicators, prognostic stratification, clinical markers, biomarkers, heart transplantation.

Introduction

Chronic heart failure (CHF) is a notorious medical and social problem that belongs to the priorities of national health systems in almost all developed and developing countries [1, 2]. This is due to the fact that despite significant, it would not be an exaggeration to say revolutionary, achievements in clinical pharmacology, cardiac surgery and implantation arrhythmology, the number of patients (especially with CHF with preserved left ventricular ejection fraction (LV)) with this disabling, expensive and often fatal condition is not decreasing in many countries, and in some, for example in Russia, it increases [3,6]. At the same time, unfortunately, in many cases, the immediate and long-term results of the so-called optimal CHF therapy are disappointing for both the patient and the doctor [7, 8]. The purpose of this lecture is to consider modern views on the problem of progressive 1 (advanced) heart failure (PSN), the prevalence of which in the population of patients with CHF it ranges from 1 to 10% [9, 10].

TERMINOLOGY IN 2007 experts of the Association of Heart Failure (ASN) of the European Society of Cardiology (EOC) proposed the term "progressive heart failure" (PSN) to refer to CHF, in which optimal drug therapy, including diuretics, inhibitors of the renin-angiotensin-aldosterone system, beta-adrenergic receptor blockers (if these drugs are not contraindicated and are well tolerated), as well as cardiac resynchronization therapy (if appropriate indications are available) are not effective (objective signs of severe cardiac dysfunction persist, such as severe systolic and (or) diastolic LV dysfunction, high ventricular filling pressure and increased levels of natriuretic peptides in blood plasma, which are associated with CHF corresponding to functional class III–IV

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(FC) according to NYHA (New York Heart Association), with dyspnoea and (or) fatigue at rest or when with minimal stress, as well as with episodes of fluid retention and (or) peripheral hypoperfusion at rest). All of the above is the reason for repeated hospitalizations (one case or more in the last six months) and justifies the need for advanced treatment methods such as heart transplantation and mechanical circulatory support, and (or) transition to palliative care [10]. In fact, it was about both not yet hopeless patients, albeit with refractory CHF, requiring consideration of the possibility of using circulatory support devices and (or) heart transplantation, and those patients with end-stage heart failure, when, due to contraindications to surgical treatment due to irreversible changes in target organs, one can only hope for palliative care assistance (for example, infusion of inotropic drugs, ultrafiltration or peritoneal dialysis and so-called end-of-life care). The well-known difficulties of accurately determining CHF FC, associated with the distinct subjectivism of the patient and the doctor in determining which restriction of physical activity is small or, conversely, significant, as well as what kind of load is habitual for the patient, have been repeatedly written, including on the pages of the journal Bulletin of Siberian Medicine [8,9]. This subjectivism naturally leads to low reproducibility of the results of the assessment of CHF FC in the same patient by different doctors. CHF affects mainly the elderly. Taking into account polymorbidity, the information content of a stress test performed to objectify FC (say, a 6-minute walking test) in these patients is often unacceptably low, since not only myocardial, but also coronary or respiratory insufficiency and other factors can affect the distance traveled by the patient [4].

At the same time, the rather loose interpretation of the NYHA classification by some doctors and researchers, which allows the allocation of intermediate values of FC (for example, III–IV), and even more active attempts to introduce additional gradations into the classification under discussion, in particular the "advanced" IIIb class, which does not have an unambiguous definition, which is vaguely characterized as more serious than with FC III, a violation of the functional status, on the one hand, but not yet as severe as with CHF corresponding to FC IV, on the other [4,5,6]. Medicine is not an exact science, but such an argument is impossible to understand. This is equivalent to trying to convince you that after tossing a coin, more than two results are possible – not only heads or tails, but also the coin hangs in the air. As for repeated hospitalizations, this is a controversial criterion, since some patients with PSN may often seek medical help unplanned and receive it on an outpatient basis (for example, in the United States in the emergency department), and some may be hospitalized for reasons not directly related to CHF (for example, exacerbation of the underlying disease or comorbid pathology, heart rhythm and conduction disorders).

The most common unplanned hospitalizations in these patients are due to acute heart failure (including so-called acute decompensated heart failure) [8] and circumstances related to refractory CHF [1,3]. The form of CHF, which, even with rapidly developing decompensation, is fundamentally different from acute heart failure [1]. D.V. Preobrazhensky et al. The concepts of "heart failure" and "chronic heart failure" are rightly considered synonyms, since, speaking of acute heart failure, it is customary to indicate its specific form − pulmonary edema, cardiogenic shock or acute pulmonary heart disease (it does not matter whether CHF preceded this or not) [2,6]. Nevertheless, in the special medical literature there is also a polar point of view, according to which acute heart failure includes episodes of acute decompensation of cardiac activity in patients with CHF in the absence of a clinic for pulmonary edema and cardiogenic shock. "The signs seem to be acute heart failure, but not acute, that's for sure."

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Like pregnancy (you can't be a little pregnant), the symptoms and signs of acute heart failure are either there or they are not (like white and black, without any shades of gray). Apparently, all clinicians, without exception, faced primary and secondary refractoriness of a patient with CHF (it is important to recall pseudo-refractoriness, for example, associated with the patient's incompetence) to the therapy, however, there are no generally accepted criteria (like those for resistant arterial hypertension [3,5,7] verification of this condition. Finally, a few words about the final (terminal) stage of CHF, which should be distinguished from PSN. According to EOC experts [7,9], the fundamental difference between PSN is the presence of a certain degree of reversibility of the severity of CHF manifestations when using cutting-edge treatment methods. The phrase "a certain degree of reversibility", devoid of unambiguity, dictates the need to search for informative discriminant signs, and doctors in the absence of the latter should not rush to sentence a patient with CHF.

Such vague criteria have become the subject of well-deserved criticism and the reason for revising the definition of PSN, which would take into account the assessment of the effectiveness of new classes of drugs (for example, sinus node If channel inhibitors, as well as angiotensin receptor inhibitors and non-lysine), characteristics of comorbid pathology and the state of target organs, as well as other variables that have been neglected by EOC experts in 2007 The agreed positions of experts from reputable cardiological communities in the Old and New World regarding the definition of criteria for the diagnosis and treatment of PSN have changed over time, but, unfortunately, their evolution has not yet ended with a complete consensus and none of the proposed interpretations is indisputable [9, 10].

DIAGNOSTIC CRITERIA Obviously, in order to speak with confidence about PSN, it is necessary to first justify the presence of heart failure in the patient himself. The principles of CHF diagnosis are well developed and set out in numerous recommendations [3, 5]. Modern criteria for the diagnosis of PSN, as a rule, include signs first formulated in 1998 by K.F.Jr. Adams and F. Zannad [2]: the LVEF value established at rest is less than 30% and CHF corresponding to III–IV FC, or the maximum oxygen consumption is less than 14 ml/ kg/min. Nevertheless, even among patients hospitalized with acute heart failure, at least half have normal LVEF values, and the absence of depression of global LV contractile function should not contradict the diagnostic conclusion about PSN in the presence of other symptoms and signs of this condition [9].

Detailed criteria for the diagnosis of PSN, formulated in the relevant memoranda of the ASN EOC [9], the American Heart Association (AAC) and the American College of Cardiology (ACC) [6], as well as the American Society of Heart Failure (AOSN) [7] are presented in Table 1. After getting acquainted with the criteria presented in Table 1, many clinicians will probably have questions. The largest list of questions, perhaps, is left by the PSN criteria presented in the AAC/ACC recommendation (in fairness, it should be noted that North American experts focused on the CHF itself, and the PSN was only briefly discussed in its context [3]), since they do not specify whether all criteria are mandatory for the verification of PSN, they are full of inaccurate formulations (for example, "often", "not infrequently") and do not contain any characteristics of the state of the cochlear and lucitropic function of the heart. However, in the absence of information on the presence and severity of global (segmental) systolic and diastolic ventricular dysfunction, as well as their remodeling, the diagnosis of CHF is not always infallible, and the diagnosis itself is flawed. In this regard, the recommendations of the 2018 ASN EOC look more perfect [9]. The latter emphasize the thorniness in the path of differential diagnosis, as indicated in paragraphs 1 and 4

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(see Table. 1) symptoms and signs may be the result of not only cardiac dysfunction, but other conditions (for example, severe lung disease, non-cardiac cirrhosis of the liver or, most often, kidney failure of a mixed nature). However, these patients have a poor quality of life and a poor prognosis and require the same attention as those with heart failure as the only disease.

The most common criteria for the diagnosis of PHF

ACH EOK, 2018	AAC/AKK, 2013	AOCH, 2015
All the criteria listed below should be present, despite the optimal treatment from the point of view of modern recommendations: 1. Severe and persistent symptoms of CHF (III–IV FC according to NYHA) 2. Severe cardiac dysfunction, determined by a decrease in LV LV of less than or 30%, isolated pancreatic insufficiency (for example, in acute pancreatic cancer) or inoperable severe congenital/acquired heart disease, or persistently high (or increasing) values of BNP or NT-proBNP and data on severe diastolic dysfunction or structural disorders of the LV in accordance with the criteria of the EOC (2016) for the SNsFV and SNprFV. 3. Episodes of pulmonary or systemic stagnation requiring the use of intravenous infusion of diuretics in high doses (or a combination thereof), or episodes of decreased cardiac output requiring the appointment of inotropic or vasopressant drugs, or malignant arrhythmia, which caused more than one unplanned visit / hospitalization in the last 12 months. 4. Severe impairment of the functional status of cardiac genesis (distance in TSHC less than 300 m or MPC less than 12-14 ml / kg/min). CHF-related dysfunction of other organs (e.g., cardiac cachexia, liver or kidney dysfunction) or type 2 pulmonary hypertension (secondary to damage to the left heart) may be present (optional criteria)	1. Repeated (two or more cases) hospitalizations or visits to the emergency department in the past year. 2. Progressive deterioration of kidney function (for example, an increase in the concentration of creatinine and urea nitrogen in the blood) 3. Causeless weight loss (including cardiac cachexia). 4. Intolerance to ACE inhibitors due to hypotension and (or) deterioration of renal function. 5. Intolerance to beta blockers due to the progression of CHF or hypotension. 6. Often the ADs is above 90 mmHg. 7. Persistent shortness of breath (dressing or bathing require breathing at rest). 8. Inability to walk one block on a flat surface due to shortness of breath or fatigue. 9. The need to escalate diuretic therapy to achieve euvolemia (the dose of furosemide is often more than 160 mg / day and (or) additional use of metolazone). 10. Progressive decrease in serum sodium (usually to a level below 133 mEq/l). 11. Frequent triggers And КД	The presence of progressive and (or) persistent signs and symptoms of severe CHF despite optimal medical, surgical and hardware correction Indicators: 1. The need for intravenous inotropic therapy to reduce symptoms or to maintain the function of the target organ 2. MPC is less than 14 ml/kg/min or more than 50% of the required level. 3. The distance in TSH is less than 300 m. 4. Repeated (two or more cases) hospitalizations in the last 12 months. 5. Unplanned (two or more cases) visits (for example, to the emergency department) in the last 12 months. 6. Progression of right ventricular heart failure and secondary pulmonary hypertension. 7. Refractory to diuretics associated with renal dysfunction. 8. Circulatory and renal disorders limiting the use of inhibitors of the renin-angiotensin-aldosterone system and beta-blockers. 9. Symptoms of progressive/persistent CHF (III–IV FC according to NYHA). 10. High risk of death within a year (20-25%) based on a predictive model (for example, SHFM, HFSS). 11. Progressive kidney or liver dysfunction. 12. Persistent hyponatremia (less than 134 meq/l). 13. Repeated paroxysms of stable ventricular tachycardia, frequent ICD triggers. 14. Cardiac cachexia. 15. Inability to perform physical activities at the level of daily activity

Heart transplantation: indications and contraindications [EOC PHF 2018]

Patients suitable for transplantation	The final stage of CHF with pronounced symptoms, an unfavorable prognosis, and the inability to use alternative treatment methods. Motivated, well-informed and emotionally stable. Able to adhere to the intensive care needed after surgery

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Contraindications	An active infection. Severe damage to the peripheral or cerebral arteries. Pharmacologically irreversible pulmonary hypertension (the use of LV UMP should be considered with subsequent reassessment of the possibility of transplantation). Cancer (consultation with an oncologist is necessary to assess the risk of tumor recurrence). Irreversible renal dysfunction (e.g. creatinine clearance less than 30 ml/min). Systemic diseases involving multiple organs. Other concomitant diseases with a poor prognosis. A body mass index of more than 35 kg/m2 (weight loss is recommended to achieve an index of less than 35 kg/m2). Continued alcohol abuse and drug use. Patients with a level of social support insufficient for compliance control in outpatient settings

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