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MEDICAL INNOVATION IN HEART FAILURE: DIAGNOSIS AND THERAPEUTIC IMPACT OF NEW DRUGS ON IMPROVING CLINICAL OUTCOMES

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ABSTRACT

Heart failure (HF) affects millions of Brazilians and is associated with high rates of morbidity and mortality. The study investigates the evolution of the diagnosis and treatment of HF, focusing on new medications and their implications for the quality of life of patients.

Keywords: Heart failure, Diagnosis.

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INTRODUCTION

Heart failure affects more than 2 million Brazilians, and through DataSus, in 2018 there were about 200 thousand hospitalizations. Data provided by the American Heart Association Circulation indicate that in 2013 there were about 17.3 million deaths caused by heart disease, and 23.6 million deaths are expected for the year 2030 worldwide. Even with the advancement of medicine in relation to diagnosis and therapy, the survival of patients after the diagnosis of HF is usually 5 years. Thus, due to its high morbidity and mortality, this is the relevance of studying this topic (GOMES, 2023).

This pathology is seen as a clinical affect of high impact on the quality of life of patients, since it is characterized by the inability of the heart to perform perfusion properly to the tissues, thus impairing the supply of nutrients and oxygen. It is a complex syndrome, resulting from several heart diseases, such as systemic arterial hypertension, cardiomyopathies, valvular heart diseases, acute myocardial infarction. Thus, it characterizes one of the causes of morbidity and mortality and hospitalization worldwide. In Brazil, its main etiologies are ischemic and hypertensive, and in the northern region, we can also highlight Chagas disease. (CORREIA, 2022).

It can be classified in various ways, such as acute vs. chronic, systemic congestion vs. pulmonary congestion, low output vs. high output, ejection fraction and hemodynamic profile. Another widely used classification is the New York Heart Association (NYHA) classification, which is used to assess the patient's level of dyspnea. Chronic HF is classified and characterized as one whose symptoms persist for more than 6 months (LEMOS, 2024).

The general objective of the study is to determine the diagnostic process, knowing how to recognize the semiological aspects of the patient, being able to apply theoretical knowledge on the subject, as well as to determine the therapeutic process in relation to the escalation of medications according to the needs of each patient.

OBJECTIVE

In recent years, advances in the management and diagnosis of HF have emerged, including new drugs, and a better understanding of its pathophysiology, thus transforming the management of these patients. These innovations aim to improve clinical outcomes, reduce hospitalization and mortality rates, and provide better quality of life for patients.

Therefore, the objectives of this study are to define the diagnostic process, analyze the impact of medical innovations on HF therapy, and the role of new medications in this scenario. That it is justified by the high rate of morbidity and mortality associated with HF in

Brazil and in the world makes this theme extremely important, understanding the need for investment and advances in the search for more effective therapies and more accurate diagnoses.

The introduction of new drugs, as well as the association between them, create opportunities for a more individualized and effective treatment for the profile of each patient. Understanding the impact of these innovations is crucial to analyze how they are necessary to modify clinical outcomes and, consequently, how to reduce the costs associated with disease management.

METHODOLOGY

Considering that theoretical studies are an indispensable basis for field and laboratory research, we opted for conceptual deepening and search for official data on the object of study, allowing the knowledge of reality as well as the possibility of critical reflection on the subject within the scope of the Brazilian reality.

Based on the understanding of Creswell (2007) for whom the Literature Review is configured as a preliminary stage of scientific studies, then the research is a Literature Review in which articles published in the National Library of Medicine (Pubmed), Virtual Health Library (VHL), Web of Science, Lilacs and Capes Journals were used as the basis of the study by descriptors obtained by the Health Sciences Descriptors (DeCS) of the VHL.

In a dialectical approach that, according to Minayo (1994), the system of relations that constructs the reality where the object of study is inserted, the research is characterized in the scope of medicine with qualifiable data, considering the analysis of the elements that constitute the limitation or potentiation of the procedure, according to the studies analyzed.

This is a literature review of articles published in the National Library of Medicine (Pubmed), Virtual Health Library (VHL), Web of Science, Lilacs and Capes Journals by descriptors obtained by the Health Sciences Descriptors (DeCS) of the VHL. The following descriptors were searched: Heart Failure AND Accession AND Decompensation AND Mortality AND Prognosis in "All fields".

For the selection of articles, the following steps were followed: (I) search for articles in the databases; (II) reading of titles and abstracts, with analysis according to the eligibility criteria and; (III) full-text analysis of the papers, including in the systematic review only those required by the inclusion criteria and did not meet any of the exclusion criteria.

As inclusion criteria, published studies were selected if they met the following criteria: (1) studies involving the pathophysiology of heart failure (2) studies that had the object of

study the relationship between adequate therapy and quality of life; (3) articles that studied the etiologies, diagnosis, and treatment of heart failure; (4) articles published in the last 13 years. There were no restrictions on sample size or foreign language.

As exclusion criteria, articles were excluded that: (1) were published before 2021; (2) studied situations that do not include heart failure; (3) duplicates; (4) had no direct relationship with heart failure, its diagnosis, or its treatment.

DEVELOPMENT

The pathophysiology of HF involves a complex interaction with various organ systems, such as neurohormonal, inflammatory, and hemodynamic factors. This lesion that causes HF can be caused directly, through direct myocardial involvement, as in coronary atherosclerotic disease, ischemic heart disease, and myocarditis. Or by excessive overloads, the result of high pressure or large volume (DA SILVA, 2022);

The main clinical manifestations of this syndrome include dyspnea, fatigue, edema, and exercise intolerance, which reflect the inability of the heart to maintain adequate cardiac output. The main semiological findings allow us to identify the origin of HF, such as right and left HF. The main symptoms of right heart failure are jugular turgidity, hepatomegaly, ascites, anorexia, hepatojugular reflex, lower limb edema. The main symptoms of left heart failure are dyspnea, orthopnea, paroxysmal nocturnal dyspnea, cyanosis, cough and tachycardia (LUQUETTI, 2024).

The diagnosis of HF is clinical, and transthoracic echocardiography should be used only for the staging of HF. The clinical criteria used for the diagnosis of HF are the Framingham criteria, which consist of major and minor criteria, where 2 major criteria are needed to close the diagnosis or 1 major + 2 minor (MARCONDES, 2021).

Major criteria are paroxysmal nocturnal dyspnea, jugular turgid, pulmonary crackles, cardiomegaly confirmed by a chest X-ray, acute pulmonary edema, B3, increased CVP (>16cm H2O), and weight loss >4.5kg within 5 days in response to treatment. The minor criteria are composed of bilateral ankle edema, nocturnal cough, dyspnea on exertion, hepatomegaly, pleural effusion, and tachycardia (MARCONDES, 2021).

After diagnostic conformation according to the Framingham criteria, an echocardiogram is required for staging. Patients with EF >50%, HF with slightly reduced ejection fraction 40-49%, and HF with reduced ejection fraction <40%) can be classified as HF with normal ejection fraction. Other complementary tests can be performed according to the individualized needs of each patient, such as chest X-ray, electrocardiogram, cardiac catheterization and some laboratory tests.

With regard to HF therapies, as a non-pharmacological measure, the guideline cites the importance of biopsychosocial support networks as well as educational interventions for these patients. Regarding the use of medications, they are used with two objectives, namely morbidity reduction and/or mortality reduction (ARDISSON, 2024; DE SOUZA, 2023).

According to the Brazilian guideline on heart failure, drug treatment of HFrEF should be initiated from NYHA II and stage C classification with symptoms. Therapy is done by staggered therapy, which adds drugs according to the patient's clinical need (NUNES, 2022; PAFFER, 2022).

Initially, it begins with the use of a triple drug therapy consisting of ACE inhibitors or ARBs + Beta-blockers + mineralocorticoid antagonists. If the patient persists with symptoms (NYHA II), a fourth drug should be added, which can be iSGLT2 (Dapagliflozin /Empagliflozin) or INRA (sacubitril valsartan), if symptoms persist I can add the fifth drug, in this case the other option of the fourth that has not yet been added to drug therapy. Clinical and functional reassessment should be performed in 3 - 6 months. Where patients who remain asymptomatic do not need to make adjustments in medications. Patients who are on NYHA II should have additional therapeutic strategies and patients with NYHA III or IV should be referred to the specialized center for advanced HF (DA COSTA, 2023; DE SOUZA, 2022)

The strategies intended for patients on NYHA II after the 3 – 6 month reassessment are for those with LVEF<35% in sinus rhythm and SBP Cardiac resynchronization therapy (CRT) should be done, for patients with LVEF<35% Afro-descendant should be added Hydralazine + nitrate, for patients with LVEF<35% with sinus rhythm and HR>70 can add Ivabradin, for patients with LVEF<45% with sinus rhythm and AF can add digoxin to their therapy and a cardiodefibrillator should be implanted in patients with LVEF <30%. (BARROS, 2024; JUNIOR, 2024)

This study presents a multidisciplinary perspective on the treatment of heart failure (HF). With advances in medicine and the adoption of healthier lifestyle habits, such as adequate nutrition and regular physical activity, in addition to the active participation of the individual in the role of prevention, self-care and control of the disease, a reduction in the consequences of HF is expected. Researchers also seek to expand scientific knowledge in various areas of medicine, focusing on the integral approach to the individual and the community, reflecting on the clinical and socioeconomic impacts that diseases cause, and

reinforcing the importance of prevention and early diagnosis for better prognosis (DAS NEVES, 2021).

FINAL CONSIDERATIONS

In summary, heart failure (HF) is one of the greatest challenges in contemporary medicine, due to its high incidence, complexity and negative impact on patients' quality of life.

However, new therapeutic approaches, including advances in medications, mechanical interventions, and cell therapies, bring optimism about more effective management of this debilitating disease. With the continued progress of research and the development of new therapies, it is expected that the prognosis of HF patients will continue to improve, reducing the burden of this condition both for health systems and for the patients themselves.

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