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MANAGEMENT OF ACUTE HEART FAILURE IN THE EMERGENCY ROOM

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ABSTRACT

Introduction: Heart failure is one of the main causes of morbidity and mortality in the world, especially in the elderly. The disease is defined as cardiac dysfunction, where the heart cannot generate an adequate stroke volume that meets the body's metabolic needs, or that it is capable of, but at the expense of higher filling pressure levels. Objective: To analyze the management of patients with acute heart failure in the emergency room. Methodology: This is an integrative review of the last 3 years, from 2022 to 2025, using the Medline, IBECS, and LILACS databases. The descriptors used were: "heart failure" "emergency" "treatment" "diagnosis" and "management". A total of 47 articles were found, which were submitted to the selection criteria. In addition, an Intensive Care Medicine document was

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Revista ARACÊ
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used. The inclusion criteria were articles that were made available in full and that were related to the proposal studied. The exclusion criteria were articles available in the form of abstracts, case reports, and those that were not related to the proposal studied. Results and Discussion: Management involves achieving hemodynamic balance, in addition to improving functional capacity, in addition to the identification of potential causes of this decompensation. It usually involves blood pressure and congestion control. The initial management of the patient is done with the use of oxygen therapy, use of vasodilators, and diuretics to improve symptoms. After the initial management, the next steps are planned, such as the evaluation of associated comorbidities for the management of other conditions, according to the patient's particularities. Patients at high risk are more likely to have complications and mortality, and hospitalization is important. Individuals at low risk may use outpatient treatment. Conclusion: From this perspective, the identification of the disease and its respective management is important to improve the prognosis.

Keywords: Heart Failure. Treatment. Handling. Emergency.

Revista ARACÊ
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INTRODUCTION

Heart failure (HF) is a global problem that affects public health, being one of the main causes of morbidity and mortality, especially in individuals aged 65 years or older (FOUNTOULAKI *et al.*, 2023). In the United States, a prevalence of 6 million citizens is estimated, and in Europe, 15 million have HF (FOUNTOULAKI *et al.*, 2023). This condition is related to frequent hospitalization in the emergency department (FOUNTOULAKI *et al.*, 2023). There has been an improvement in the mortality rate in recent years, but it is still an important value (SILVERS *et al.*, 2022). The mortality rate in 30 days, 1 year, and 5 years, corresponds, respectively, to 10%, 22%, and 42% (SILVERS *et al.*, 2022).

The disease is defined as cardiac dysfunction, where the heart cannot generate an adequate stroke volume that meets the body's metabolic needs, or that it is capable of, but at the expense of higher filling pressure levels (AZEVEDO, 2022). This results in greater work of the heart at higher diastolic pressures to generate systolic volumes reduced to that of a normally healthy heart (AZEVEDO, 2022). There is an increase in left atrial pressure and venocapillary hypertension, which is associated with the formation of pulmonary edema, and decreased effective systolic and arterial volume, resulting in water and sodium retention (AZEVEDO, 2022). Venous hypertension and systemic congestion are some of the important characteristics in patients with this decompensated disease (AZEVEDO, 2022).

Risk factors for increased morbidity and mortality in acute heart failure (ACF) in emergency room patients are hypotension, impaired renal function, ECG evidence of ischemia, hyponatremia, and elevated cardiac biomarkers, such as troponin (FOUNTOULAKI *et al.*, 2023).

One of the main clinical manifestations of patients with ACF is dyspnea in the emergency room (FOUNTOULAKI *et al.*, 2023). It is related to the gradual or rapid deterioration of HF signs and symptoms, requiring urgent treatment to improve the prognosis (SILVERS *et al.*, 2022). The manifestations are related to increased pulmonary congestion, promoting an increase in left ventricular filling pressure, and may be present in patients with reduced ejection fraction and normal fraction (SILVERS *et al.*, 2022).

The diagnosis is made by clinical history and physical examination, in addition, tests such as electrocardiogram (ECG), natriuretic peptides, ultrasonography, and chest X-ray can help in this diagnosis (FOUNTOULAKI *et al.*, 2023). Ultrasound helps in cases of

Revista ARACÊ
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diagnostic doubts, due to its good sensitivity, and it is important to identify and treat it to improve the patient's prognosis (RUSSELL *et al.*, 2023; SCOTT *et al.* 2024).

The main clinical classifications of HF are NYHA and ACC/AHA (Table 1):

Table 1: CI Classification

Functional Classification (NYHA)	CI Internships (ACC/AHA)
Class I – no symptoms and limitations of routine activities; > 6 METs in ergometry	Stage A – high risk of heart failure, but without structural abnormalities or Functional
Class II – mild symptoms and limitations in routine activities. Dyspnea on usual exertion. 4 to 6 METs in ergometry.	Stage B – presence of disease cardiac structural, but clinical manifestations
Class III – with significant limitation in physical activity; Activities that are less than routine produce symptoms. Dyspnea on exertion less than the Usual. 2-4 METs in ergometry.	Stage C – the presence of signs and Heart failure symptoms associated with structural disease base
Class IV – symptoms present even at rest. Does not tolerate ergometry.	Stage D – structural disease advanced cardiac symptoms heart failure to rest

ACC: American College of Cardiology; AHA: American Heart Association; NYHA: New York Heart Association. MET: the metabolic equivalent of the task.
Source: Intensive Care Medicine, 2022.

Appropriate treatment in the emergency department is important to improve patient morbidity and mortality (FOUNTOULAKI *et al.*, 2023).

The objective of this study is to analyze the management of patients with acute heart failure in the emergency room.

METHODOLOGY

This is an integrative review of the last 3 years, from 2022 to 2025, the website used for research was the Virtual Health Library (VHL) and the Medline, IBECS, and LILACS databases. The descriptors used were: "heart failure" "emergency" "treatment" "diagnosis" and "management". A total of 47 articles were found, which were submitted to the selection criteria. In addition, an Intensive Care Medicine document was used.

Revista ARACÊ
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The inclusion criteria used were language-independent articles, from 2022 to 2025, which were related to the study proposal and which were made available in full. The exclusion criteria were: articles available in the form of abstracts, case reports, and those that were not related to the proposal studied.

After the selection, 10 articles remained, in addition to the intensive care medicine document. The articles were submitted to a thorough analysis for data collection. The results were shown descriptively.

RESULTS AND DISCUSSION

Management involves achieving hemodynamic balance, in addition to improving functional capacity, in addition to identifying potential causes of this decompensation (SAX *et al.*, 2022). In the emergency room, ICA is focused on ensuring hemodynamic stability and symptom improvement (SAX *et al.*, 2022). It is usually related to blood pressure control and the degree of congestion (SAX *et al.*, 2022). The use of vasodilators can be used to correct high filling and/or afterload pressures (SAX *et al.*, 2022). There is no better vasodilator, although nitroglycerin is more commonly used because it is easier to titrate (SAX *et al.*, 2022).

Regarding the treatment of congestion, diuretics can be used, which are responsible for symptomatic improvement in the first hours of their administration (SAX *et al.*, 2022). The treatment of this congestion is one of the key points to be done (SAX *et al.*, 2022). Persistence of congestion is associated with one of the main factors of rehospitalization (MIRÓ *et al.*, 2022).

After initial management, next steps are planned, such as the evaluation of associated comorbidities, such as subacute hypoperfusion, advanced chronic kidney disease, uncontrolled arrhythmias, diuretic resistance, severe valvular disease, significant congestion, or new-onset HF (SAX *et al.*, 2022). In these cases, where they are considered more severe, hospitalization should be carried out for evaluation and more intensive care, to control and treat these conditions and thus improve the patient's prognosis (SAX *et al.*, 2022; MIRÓ *et al.*, 2023). Patients without comorbidities who have a lower risk for the evolution of more severe conditions and with a lower chance of mortality, after initial treatment, if symptoms improve, a plan for hospital discharge, outpatient follow-up, and a therapeutic plan can be established to ensure this continuous improvement of symptoms after discharge (SAX *et al.*, 2022; MIRÓ *et al.*, 2023). Medication adjustment after

Revista ARACÊ
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discharge should be performed, such as the use of diuretics (MIRÓ *et al.*, 2022). Medications that are associated with reduced patient readmission to the hospital, such as the use of angiotensin-converting enzyme (ACE) inhibitors or sacubitril-valsartan, SGLT2 inhibitors, beta-blockers, spironolactone, coronary artery bypass grafting surgery (AZEVEDO, 2022). Medications, including ACE inhibitors and beta-blockers, are important because they modify the course of the disease and improve the prognosis (MIRÓ *et al.*, 2022).

In the emergency room, the use of drugs such as enoxaparin, clopidogrel, and acetylsalicylic acid is observed (DA SILVA TEIXEIRA *et al.*, 2024). Its use is related to the fact that patients with HF have a higher risk of thrombosis, and the use of enoxaparin is justified (DA SILVA TEIXEIRA *et al.*, 2024). Antiplatelet agents, on the other hand, can be used as a preventive role for possible cardiovascular events, since acute coronary syndrome is a common cause of decompensation of this disease (DA SILVA TEIXEIRA *et al.*, 2024).

In cases of atrial fibrillation associated with ACF in the emergency department, rate control and rhythm control, when indicated, in addition to anticoagulation, are important aspects of therapeutic intervention (VELLIOU *et al.*, 2023)element.

It is important to identify the particularities and clinical profiles of patients, not only initially guaranteeing treatment with diuretics and vasodilators, in addition to oxygen therapy (PEÑA-GIL, 2022; DA SILVA TEIXEIRA *et al.*, 2024). Each one has specific therapeutic objectives depending on its particularities, and it is important to control blood pressure, both preload and afterload with the use of vasodilators, the reduction of congestion by the use of diuretics, control rhythm and frequency with the use, example, of negative antiarrhythmics and chronotropic, the improvement of cardiac output with the use of inotropes or the correction of reversible measures, such as advanced therapies, cardiac surgery and coronary revascularization (PEÑA-GIL, 2022; DA SILVA TEIXEIRA *et al.*, 2024). In most cases, patients with preserved systolic function do not require the use of inotropes for hypotension (PEÑA-GIL, 2022).

CONCLUSION

From this perspective, the importance of identifying this condition through clinical findings is evidenced, in addition to complementary and imaging tests, if necessary, for the diagnosis. Early identification and its respective treatment are important to improve the

Revista ARACÊ
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prognosis. Initial management is done with the use of oxygen therapy, use of vasodilators, and diuretics to improve symptoms. Other medications may be used depending on the patient's comorbidities and particularities. The identification of risk factors is important to guide the therapy and management of the patient, ranging from hospitalization in those with a higher risk of mortality and complications, to outpatient management in those at low risk.

Revista ARACÊ
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