

Decompensation Factors in Heart Failure: Analysis of 100 Cases in the Emergency Department of a Moroccan University Hospital

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1. Abstract

Heart failure (HF) is a major public health issue, particularly in Morocco, where data on precipitating factors remain limited. This study aimed to identify the main triggers of acute decompensation and to analyze the epidemiological, clinical, and therapeutic characteristics of patients admitted for acute HF at the Emergency Department of Ibn Sina University Hospital in Rabat. A prospective observational study was conducted over one year (2022–2023), including 100 patients. The mean age was 68.2 years, with a male predominance (sex ratio 1.3). The most frequent cardiovascular risk factors were hypertension (62%) and diabetes mellitus (58%). Infections accounted for 49% of decompensation episodes, followed by acute coronary syndrome (11%) and arrhythmias (10%). Heart failure with reduced ejection fraction (HFrEF) was predominant (51%). These findings emphasize the importance of infection prevention and optimized management, particularly for HFrEF, to reduce hospital readmissions and improve patient outcomes.

2. Introduction

Heart failure (HF) is a chronic and progressive condition affecting approximately 2% of the global population, it represents a significant challenge for healthcare systems worldwide. In Europe, nearly 15 million individuals are affected. In Morocco, where hypertension and diabetes are highly prevalent, HF has become an important cause of morbidity and mortality. Acute episodes of decompensation, often triggered by infections, arrhythmias, or coronary events, are responsible for repeated hospitalizations and a worsening prognosis. However, local data on the clinical profile and precipitating factors of HF decompensa-

tion remain limited. The present prospective study, conducted at the Emergency Department of Ibn Sina University Hospital in Rabat, aimed to describe the epidemiological and clinical characteristics of patients admitted for acute decompensated heart failure (ADHF), to identify the most frequent precipitating factors in this population, and to analyze therapeutic management in the emergency setting. Particular attention was given to the role of infections and to the predominance of heart failure with reduced ejection fraction (HFrEF), which represents the most frequent phenotype in our series.

3. Materials and Methods

A prospective, observational, and descriptive study was conducted at the Emergency Department of Ibn Sina University Hospital in Rabat over a twelve-month period from January 2022 to January 2023. Patients admitted for acute decompensation of previously diagnosed chronic heart failure were included. The diagnosis of chronic HF was established based on documented medical history and confirmed by recent echocardiography. Decompensation was defined clinically by worsening dyspnea according to the NYHA classification and/or the onset or worsening of peripheral edema. Exclusion criteria were patients with no prior history of chronic HF, de novo acute HF, incomplete medical records, or conditions interfering with the clinical assessment such as acute renal failure, pulmonary embolism, hypoxemic pneumonia, or acute exacerbation of chronic obstructive pulmonary disease. Data collection was performed using a standardized questionnaire designed for this study. Demographic characteristics, medical history, comorbidities, clinical and para-clinical parameters, as well as therapeutic interventions were

systematically recorded. Precipitating factors were identified through cross-analysis of clinical, biological, and imaging data, with final adjudication by the attending physician.

4. Results

A total of 100 patients were included. The mean age was 68.2 ± 11.7 years, with a male predominance (sex ratio 1.3). The majority were married (61%) and unemployed (51%). The overall educational level was low. Hypertension (62%) and type 2 diabetes mellitus (58%) were the most common cardiovascular risk factors, followed by dyslipidemia (41%), obesity (36%), and active smoking (30%). Chronic kidney disease and chronic respiratory disorders were also frequent comorbidities. Ischemic cardiomyopathy was the leading underlying etiology of HF (43%), followed by valvular heart disease (15%). Heart failure with reduced ejection fraction (HFrEF) accounted for 51% of cases, while preserved ejection fraction (HFpEF) was present in 24%.

Infections emerged as the predominant precipitating factor for decompensation, identified in 49% of patients, mostly of respiratory origin. Other triggers included poor treatment adherence (11%), acute coronary syndrome (10%), arrhythmias (9%), and anemia (8%).

5. Discussion

Acute decompensated heart failure (ADHF) remains a frequent and complex condition, presenting both diagnostic and therapeutic challenges. Our study conducted in the Emergency Department of Ibn Sina Hospital in Rabat provides valuable insights into the epidemiological, clinical, and therapeutic profile of Moroccan patients, while allowing comparison with international registries. The mean age of our cohort was 68.2 years, consistent with findings from registries such as ADHERE and OPTIMIZE-HF, which also report a predominance of male patients. However, some European cohorts, including the ESC-HF Pilot, describe a higher proportion of women, which may reflect differences in healthcare access and follow-up. The low educational level observed in our series highlights a socio-economic vulnerability that likely contributes to poor treatment adherence, irregular follow-up, and limited access to preventive care, ultimately increasing the risk of decompensation. Hypertension and diabetes were the most common comorbidities, in line with international data. Their frequent coexistence, well described in the literature, creates a fertile ground for cardiovascular deterioration. The relatively high prevalence of these risk factors in our cohort may reflect insufficient disease control within the local healthcare system. Ischemic cardiomyopathy was the most frequent etiology, consistent with findings from ADHERE and OPTIMIZE-HF. Nevertheless, regional variations exist; for example, the study by Damasceno et al. in sub-Saharan Africa reported a lower prevalence of ischemic heart disease, reflecting distinct epidemiological patterns. Infections emerged as the leading cause of decompensation in our cohort, with a higher prevalence than in other series such as HEFESTOS or that of Diaz et al. This could be explained by the higher burden of respiratory infections in our setting, influenced by unfavorable

socio-economic conditions and limited access to primary care. Heart failure with reduced ejection fraction was the predominant phenotype, similar to European cohorts, and is associated with higher risks of readmission and mortality. This underscores the need for optimized therapeutic strategies and close follow-up. Loop diuretics, particularly furosemide, remain the cornerstone of treatment for volume overload, providing effective symptom relief although resistance remains a clinical challenge. Non-invasive ventilation and continuous positive airway pressure were also effective in reducing the need for intubation and respiratory complications, findings that are consistent with international evidence, although their long-term impact on mortality remains to be clarified.

6. Conclusion

This study provides new insights into the clinical and epidemiological characteristics of patients admitted for acute decompensated heart failure at Ibn Sina University Hospital in Rabat. Infections, particularly respiratory, were the leading precipitating factor, highlighting the importance of targeted preventive strategies in this vulnerable population. The predominance of HFrEF further emphasizes the need for optimized therapeutic management and improved access to evidence-based therapies. Strengthening infection prevention, enhancing treatment adherence, and improving post-discharge follow-up may contribute to reducing readmission rates and improving patient outcomes.

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