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EDITORIAL COMMENT

Profile of the acute heart failure patient in Portugal

Perfil do doente com insuficiência cardíaca aguda em Portugal

Dulce Brito

Cardiology Department, Santa Maria University Hospital, Lisbon; CCUL (Cardiology Centre, Lisbon University, Portugal

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This editorial refers to ''Characterization of acute heart failure hospitalizations in a Portuguese cardiology department'' by A.C. Pinho-Gomes et al.

Acute heart failure (AHF) is a highly prevalent condition, a common cause of hospitalization associated with significant in-hospital mortality and poor short- and longer-term outcomes, and represents a significant burden on overall healthcare costs.[1–8]

The condition is difficult to define and classify. The latest ESC guidelines on acute and chronic heart failure (HF) refer to AHF as ''the term used to describe the rapid onset of, or change in, symptoms and signs of heart failure. It is a life-threatening condition that requires immediate medical attention and usually leads to urgent admission to hospital.''[9] The assumptions included in this apparently undefined ''definition'' of AHF in fact apply to all forms of acute heart failure, a complex clinical syndrome that varies widely in terms of underlying pathophysiologic mechanisms, clinical presentations and targeted therapies.

Most AHF patients presenting to an emergency department are admitted to hospital[10–12] and it is the most common diagnosis at discharge in patients aged >65 years. The syndrome's high in-hospital mortality of 3-12% and short-term readmission rate of 25-30%, with the associated costs, are critical issues worldwide.[1–6,13,14]

The heterogeneity of AHF syndrome(s) hinders any attempt at classification or application of a single-algorithm approach. AHF may present either as new-onset HF or worsening of pre-existing HF, and these two forms may differ in causes, precipitating factors, associated comorbidities, therapeutic options, in-hospital mortality and post-discharge prognosis.[1–4,13,15]

Regarding clinical presentations, data from the Euro-Heart Failure Survey (EHFS) II (3580 patients with AHF enrolled) showed that 65.4% of patients presented with decompensated HF, 11.4% with hypertensive HF, 16.2% with pulmonary edema, 3.9% with cardiogenic shock, and 3.2% with isolated right HF.[3] Cardiac dysfunction may be due to different causes, including acute coronary syndromes, valve dysfunction, arrhythmias, pericardial disease, and increased left ventricular afterload. These different causes (which can also act as precipitating factors for the syndrome) may coexist and interact in the same patient, modulating clinical presentation and influencing management options and outcomes.[9]

Data on AHF studies and registries provide valuable information regarding the pathophysiologic, therapeutic, and prognostic issues related to different clinical scenarios; they are useful for assessing the extent of compliance with heart failure management guidelines and can help improve clinical assessment and both short- and long-term outcome. Also, analysis of similarities and differences in patient characteristics and management in different centers and countries, in various settings, may help to determine the most useful independent predictors of a worse prognosis and to define better strategies to obtain more favorable outcomes.

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E-mail address: dulcebrito59@gmail.com

The paper by Pinho-Gomes et al. in this issue of the *Journal*[16] presents the results of a hospital-based, observational, retrospective cohort study conducted in a single large Portuguese center (a teaching hospital), focusing on acute heart failure admissions to the cardiology department during 2010. Patients enrolled met the ESC criteria for HF[9] and were selected by review of the medical records of patients discharged with a diagnosis of AHF (either primary or secondary to another acute cardiac event). Acute coronary syndromes (ACS) patients were included. All patients were followed for at least 12 months after discharge.

The study aimed to clarify the overall clinical characteristics of patients with AHF and their hospital management and outcomes, and also to identify predictors of rehospitalization or death at six and 12 months after discharge. Importantly, patients admitted in two different AHF clinical contexts — ACS vs. non-ACS — were compared.

AHF accounted for 21% of all admissions (201/924) over the one-year inclusion period. Most were men (61%) and the mean age was 69 years. AHF was new-onset in 53% and most admissions (63%) were in the context of ACS.

The prevalence of new-onset AHF as well as of ACS as the precipitating factor were both higher than in the EHFSII[3] and ALARM-HF[14] studies that included patients of a mixed provenance (internal medicine and cardiology wards). However, new-onset AHF was lower than in ATTEND,[13] an epidemiological study of AHF in the Asia Pacific region that excluded patients with ACS. Acute decompensated chronic heart failure (DCHF) was the clinical presentation in 46.8% of patients and pulmonary edema in 21.4%, similar to other studies.[3,14]

Comparison of AHF patients presenting with or without ACS showed significant differences, on the basis of which two different clinical profiles can be defined. Patients presenting with ACS as the precipitating event were younger, less often men, and more commonly had a history of chronic hypertension (72.4% vs. 55.4%) and coronary artery disease (45% vs. 27%). New-onset HF was the rule (74% vs. 17.6%) and pulmonary edema was a common clinical presentation (26% vs. 13.5%). In contrast, patients with non-ACS AHF were older and more often men, the cause of cardiac dysfunction was more frequently valve disease (31% vs. 5.5%) or dilated cardiomyopathy (17.6 vs. 1.6%), and a history of previous HF hospitalizations was more common (25.7% vs. 8.7%), as was atrial fibrillation (46% vs. 22%). The factor triggering AHF in this population was frequently arrhythmia (39.2%) and DCHF was the dominant acute clinical presentation (82.4%).

The prevalence of cardiovascular diseases — hypertension and coronary artery disease being the most common — and of non-cardiovascular morbidities was comparable to those in previous larger surveys.[1,3,13,14] Echocardiographic examination and plasma brain natriuretic peptide (BNP) measurement were performed on admission (or within a few days) in 96.5% and 90% of patients, respectively, showing good adherence to the ESC guidelines.[9] Most patients (73.2%) had reduced ejection fraction (77.6% of ACS patients and 65% of non-ACS patients). However, in proportion, more non-ACS patients showed either more severe systolic dysfunction than ACS patients (42% vs. 32.8%, p=0.01) or preserved systolic function (34.8% vs. 22.4%, p=0.01), these dissimilar functional phenotypes being in line with the heterogeneity of AHF syndromes.

On admission, blood pressure, heart rate, oxygen levels, serum hemoglobin, sodium and potassium, and creatinine clearance were similar in patients presenting with ACS to those with non-ACS presentation. Acute coronary syndrome patients, as expected, were admitted more often to the intensive cardiac care unit (ICCU), more frequently underwent coronary angiography and percutaneous interventions, and were more often treated with intravenous vasodilators, non-invasive ventilation and intra-aortic balloon pump. However, invasive ventilation was needed to a similar degree in both populations, as were therapy with intravenous diuretics and inotropes, renal filtration, and ICD implantation. Overall, acute care management was similar to previous studies, although intravenous inotropes were used less often[1,3,14] and percutaneous coronary interventions were performed more frequently[1,3] due to the high proportion of ST-segment elevation ACS patients in this study.[16]

Rates of prescription of major oral HF medications increased from admission to discharge, a common observation in several previous studies.[1,3,13] One possible reason in the study by Pinho-Gomes et al. may be the low (15%) rate of previous HF-related admissions.

The mean total hospital stay was 11 days and in-hospital mortality was 5.5%, similar in patients with or without ACS presentation. A shorter in-hospital stay (4.3–9 days) was reported in ADHERE,[1] EHFS II[3] and ALARM-HF,[14] while in ATTEND a surprising long in-hospital stay (21 days) was observed.[13] In-hospital mortality also varied significantly between different studies, being 3.8% in ADHERE[1] and OPTIMIZE-HF,[17] 6.7% in EHFS II,[3] 7.7% in ATTEND,[13] and 12% in ALARM-HF.[14] Lower in-hospital mortality may be related to shorter in-hospital stay, although this may not necessarily translate into better short- or long-term prognosis in HF patients.[17] Several factors may be expected to be associated with longer in-hospital stay in AHF patients, particularly high BNP on admission and need for ICCU admission, both signs of worse clinical status.

The HF rehospitalization rate and all-cause mortality in this study were respectively 20.9% and 10.9% at six months and 23.9% and 15.9% at 12 months, and did not differ in patients with or without ACS at index presentation. However, HF mortality at six months was significantly higher in patients outside the setting of ACS presentation at index admission (12.2% vs. 4.7%, p=0.053), a population that presented mostly with DCHF. In fact, post-discharge prognosis appears in general to be better in patients with new-onset AHF. Data from the Italian registries showed that post-discharge mortality at both six months and one year was lower in new-onset AHF patients than in those with pre-existing chronic HF, and the rehospitalization rate was also lower in the former group.[2,8] In other studies[4,7,15] the results were also consistent with a better clinical course in patients with new-onset HF, whereas a previous history of worsening HF was shown to be an independent predictor of mortality. There also appears to be a cumulative risk with increasing duration and number of HF hospitalizations.[7]

In the study by Pinho-Gomes et al., a previous history of HF hospitalization was an important predictor of rehospitalization or death during one-year follow-up after first hospital discharge (threefold increase in risk). Low sodium on admission and the presence of atrial fibrillation were

the other predictors of higher risk, while reduced LVEF on admission conferred a decreased risk of rehospitalization or death. The reason for this latter finding is not clear, as reduced LVEF was similarly present on admission in patients with or without ACS, the former presenting mostly with new-onset AHF and having better associated long-term prognosis than the latter. Reduced LVEF on admission may have been modified after percutaneous coronary revascularization procedures (performed in half of ACS patients), or left ventricular remodeling may have occurred during follow-up after the ACS and be a confounding factor regarding the effect of initially measured LVEF on long-term prognosis. Also, patients with reduced or preserved ejection fraction on admission were not compared head-to-head. Comparison was mainly between AHF patients with and without ACS on presentation.

When comparing AHF studies, several issues need to be clarified, particularly the criteria for syndrome definition on admission, the admission setting (emergency department, intensive care unit, cardiology ward or internal medicine ward) and types of patients included (ACS patients often require different and specific management). Also, HF with reduced and with preserved ejection fraction are to some extent different entities with distinct risk factors, management and prognosis.[18,19]

Each of these variables contributes to different results because the populations are dissimilar, are managed differently, and may have also different prognosis in both the short and long term. Despite the limitations pointed by the authors, the study by Pinho-Gomes et al.[16] contributes significantly to our knowledge of the situation in Portugal concerning acute heart failure admissions and helps to identify a subset of high-risk patients most in need of close surveillance, ideally to be included in an HF management program.

Conflicts of interest

The authors have no conflicts of interest to declare.

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