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IM - COMMENTARY

Risk stratification in hospitalized heart failure patients: do the RIGHT thing!

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Heart failure with preserved ejection fraction (HFpEF) is intended to become a major challenge in the upcoming years for all clinicians. According to American forecasts, HFpEF prevalence will probably rise up by 2050 to 60% of all heart failure (HF) phenotypes, almost doubling the prevalence of heart failure with reduced ejection fraction (HFrEF) [1]. A peculiarity of HFpEF patients commonly display a higher load of complexity and unfortunately, an evidence-based treatment aimed at improving HFpEF outcomes is not to date available [2]. Indeed, most recent guidelines suggest as only recommended treatment the treatment of the underlying clinical conditions [2]. Thereby, the identification of a cluster of patients burdened by a more severe syndrome is extremely helpful to implement more aggressive strategies and closer follow-ups.

In this regard, the data provided by Parrinello et al. [3] on this issue of Internal and Emergency Medicine may represent an important turning point in our understanding of HFpEF clinical syndrome. A cohort of 135 patients admitted for acute heart failure was prospectively enrolled in the study to find predictors of all-cause mortality. Patients were divided according to their left ventricular (LV) ejection fraction (EF) in HFpEF (LV EF $\geq$ 50%) and HFrEF (LV EF $<$ 50%) and followed for 25.4 months after discharge. Right ventricular diameter (RVd) (HR 2.4, $p = 0.04$), inferior vena cava diameter (HR 1.06, $p = 0.02$), and blood urea nitrogen (BUN) (HR 1.02, $p = 0.01$) resulted to be independent predictors of all-cause mortality in HFpEF, whereas left atrial (LA) volume was the only one resulting positive (HR 1.06, $p = 0.006$) in the multivariate Cox analysis in the subgroup of patients with HFrEF.

According to this interesting report, two easily assessable parameters are likely to gather relevant prognostic clues in acutely ill HFpEF patients. These data are pretty translatable onto clinical practice since a quick assessment of HF severity in the emergency room is a turning point in the management of these patients [4]. Although remarkable, these results are not surprising since the ability of the right ventricle–pulmonary circulation unit to cope with the increased filling pressure of the left ventricle is a major determinant of survival of HFpEF patients [5]. Looking back to physiopathology (as depicted in Fig. 1), the rise in pulmonary pressures in all HF phenotypes is due to the impaired LV filling pressures, mainly up until the LA is no longer able to compensate them [6]. In this scenario, the right atrium (RA) plays the pivotal role of the reservoir of the increased pulmonary pressure [6]. Indeed, RV diastolic dysfunction appears before RV systolic impairment in animal models of right heart overload [5]. Thereafter, several pathomechanisms lead to RV remodeling and hypertrophy, which in turn lead to an increase in tricuspid regurgitation, impairment of pump function up to end-stage right heart failure and death [7].

According to Parrinello et al. [3], just an easy measurement such as RVd is enough to stratify prognosis in HFpEF. Given this magnitude, it is reasonable to suggest an appropriate assessment of RV dimension in all HFpEF patients, although trans-thoracic echocardiography may be limited by the irregular shape of the RV [5]. To overcome this limitation, a multiparametric assessment encompassing also RV area may be helpful [8].

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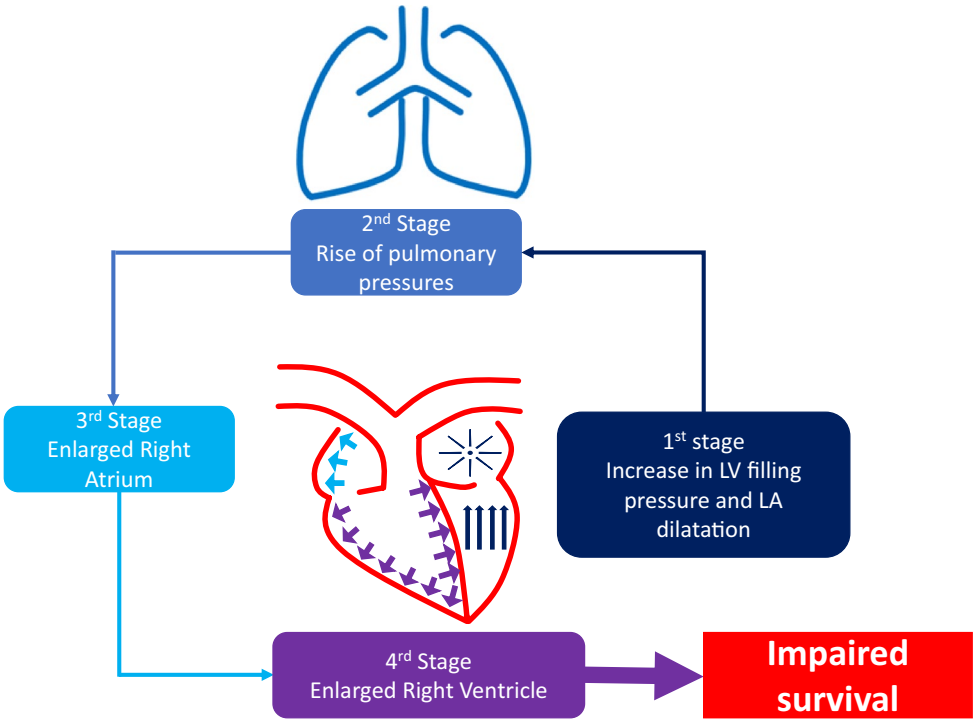

Fig. 1 Right ventricular dysfunction in left-sided chronic heart failure

Several relevant issues should be also addressed. First, the right heart–pulmonary circulation (RVPCU) unit is a high-flow low-resistance system in normal conditions. Stressing the RVPCU might be dramatically helpful to unmask symptoms of RV failure not clear at rest [9].

Moreover, evidence-based treatment of HFpEF is to date unfortunately not available, as mentioned above [2]. Given the relevance of RV as a strong predictor of HFpEF-related outcome, the focus of future research should be the reduction of RV size, as for other conditions. Furthermore, the involvement of lung parenchyma should also be evaluated in the emergency room, especially in the frequent case of concomitant chronic obstructive pulmonary disease [10].

In conclusion, the work of Parrinello et al. [3] confirms that even simple and easy measures of RV size are strong predictors of mortality in HFpEF. However, more research is warranted in the future to evaluate how to target RV impairment in HFpEF.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Statement of human and animal rights This article does not contain any study with human and animals performed by any of the authors.

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