ACUTE HF score predicts in-hospital mortality in patients with acute heart failure

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Background: ACUTE HF is a multiparametric score combining clinical, biochemical and echocardiographic indexes, which was developed and validated in different studies as a prognostic tool in acute heart failure (HF) patients for the prediction of 30-days, 6-months and 5-years mortality after discharge. However, in these critical patients the prediction of in-hospital mortality may be fundamental to guide therapeutic management during hospital stay.

Objective: The aim of our study was to assess the prognostic value of ACUTE HF score for in-hospital mortality in an external cohort of patients hospitalized for acute HF.

Methods: Consecutive patients hospitalized for acute HF between 2020 and 2021 in our University Hospital were retrospectively enrolled. Patients with unclear diagnosis of de-novo, decompensated HF or HF reacutization were excluded. Clinical, biohumoral and echocardiographic data were collected. ACUTE HF score was calculated as: \[1.4 \times \text{serum creatinine} + 2 \times 2 \text{mg/dl} + 0.8 \times \text{ejection fraction} + 0.7 \times \text{prior hospitalization for AHF} + 0.9 \times \text{prior stroke/transient ischemic attack} + 0.5 \times \text{more than moderate mitral regurgitation} + 0.8 \times \text{use of non-invasive ventilation}\]. Then, it was used to divide the population into three risk groups (low risk: ACUTE HF \leq 1.5; intermediate risk: 1.5 < ACUTE HF \leq 2.5; high risk: ACUTE HF > 2.5).

Results: Overall, 1291 patients were included in the present study (age = 77 ± 13 years, mean ejection fraction = 41 ± 13%). Median in-hospital follow up was 9 [6;15] days, during which 115 patients died. Patients who died during hospitalization were older, had worse renal function and higher mitral regurgitation severity, and more frequently had arterial hypertension, diabetes mellitus, chronic obstructive pulmonary disease and history of stroke. With ROC curves, it showed to be a good predictor of in-hospital mortality, with an AUC = 0.66, which was even higher in patients with preserved ejection fraction (AUC = 0.76, Fig.1). With multivariate analysis, ACUTE HF score showed to be a predictor of in-hospital mortality independent from arterial hypertension, diabetes mellitus, chronic kidney disease (OR = 1.5 [C.I. 1.22 – 1.81 each point increase]). Kaplan Meier analysis showed a good risk stratification of study cohort divided into 3 risk groups according to ACUTE HF (Fig.2).

Conclusions: ACUTE HF score is an independent and reliable predictor of in-hospital mortality in patients hospitalized for acute HF. After multiple external validation, considering its rapid and easy calculation, we suggest its use in the management algorithms of acute HF patients in daily clinical practice.

Fig.1
Fig. 2