In-hospital prognosis of patients with primary and secondary acute heart failure diagnosis

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Introduction: Secondary acute heart failure (AHF) during hospitalization for another primary diagnosis is a frequent in-hospital complication.
Purpose: This analysis aims to describe differences in prognosis of these patients in comparison with patients admitted for AHF (primary AHF diagnosis) and also identify factors associated with in-hospital mortality.
Methods: This is a sub-analysis of the Acute Heart Failure Global Survey of Standard Treatment (ALARM-HF), which enrolled 4953 patients from 9 countries. All parameters univariately associated with in-hospital mortality in the primary and secondary AHF groups were included in the multivariate logistic regression model.
Results: Secondary AHF diagnosis was observed in 24.1% (N=1196) of the total study cohort. These patients demonstrated almost double all-cause in-hospital mortality rates compared to patients with primary AHF (16.9% versus 8.9%, $p<0.001$).
In patients with primary AHF, negative prognostic factors included older age (>75 years) (OR 2.01, 95% CI 1.24–3.26, p=0.004), acute coronary syndromes (ACS) (OR 2.71, 95% CI 1.57–4.69, $p<0.001$), chronic renal disease (OR 2.02, 95% CI 1.13–3.61, p=0.017), presence of cold extremities (OR 2.04, 95% CI 1.23–3.40, p=0.006), in-hospital treatment with CPAP (OR 2.55, 95% CI 1.20–5.41, p=0.014), dobutamine (OR 2.55, 95% CI 1.52–4.28, $p<0.001$), dopamine (OR 3.03, 95% CI 1.74–5.27, $p<0.001$) and noradrenaline (OR 4.76, 95% CI 2.32–9.76, $p<0.001$). Favorable predictors were systolic blood pressure ≥100 mmHg on admission (OR 0.54, 95% CI 0.31–0.94, p=0.031), in-hospital treatment with ACEIs (OR 0.07, 95% CI 0.03–0.16, $p<0.001$), ARBs (OR 0.30, 95% CI 0.13–0.70, p=0.005) and vitamin-K antagonists (OR 0.06, 95% CI 0.007–0.44, p=0.006).
In secondary AHF, independent predictors of in-hospital mortality included left ventricular ejection fraction (LVEF) <40% (OR 2.36, 95% CI 1.17–4.75, p=0.016), age >75 years (OR 2.23, 95% CI 1.09–4.54, p=0.026), ACS (OR 3.55, 95% CI 1.50–8.39, p=0.004), diabetes (OR 2.26, 95% CI 1.23–4.16, p=0.008), pre-admission treatment with digoxin (OR 7.27, 95% CI 1.83–28.87, p=0.005), in-hospital medication with dobutamine (OR 2.43, 95% CI 1.28–4.61, p=0.006), dopamine (OR 2.29, 95% CI 1.12–4.67, p=0.022) and noradrenaline (OR 4.14, 95% CI 1.76–9.76, p=0.001). Covariates independently associated with survival benefit in secondary AHF were pre-admission treatment with diuretics (OR 0.29, 95% CI 0.09–0.88, p=0.030) and in-hospital treatment with ACEIs (OR 0.17, 95% CI 0.07–0.39, $p<0.001$) and aspirin (OR 0.27, 95% CI 0.11–0.69, p=0.006).
Conclusion: Patients with secondary AHF experienced a more complicated in-hospital course with worse prognosis, compared to primary AHF. LVEF <40%, age >75 years, ACS, diabetes, pre-admission treatment with digitalis, in-hospital medication with dobutamine, dopamine and noradrenaline were identified as independent negative prognostic factors of in-hospital mortality in secondary AHF patients.