Hyponatremia and in-hospital outcomes of patients admitted for heart failure: analysis of the national inpatient sample

C. Kang, I. Asemota, V. Reyes Pinzon, P. Khamooshi, R. Atluri, R. Soon-Shiong
J.H. Stroger Hospital of Cook County, Chicago, United States of America

Funding Acknowledgement: Type of funding sources: None.

Background: Hyponatremia serves as a well established predictor of mortality for advanced heart failure (1). The aim of this study is to reassess the association between hyponatremia and in-hospital outcomes in patients with acute decompensated heart failure (ADHF) by using a nationally representative sample.

Methods: We queried the National Inpatient Sample (NIS) database collected between 2016 and 2018 to identify patients with a primary diagnosis of HF and stratified the cohort on the basis of presence or absence of hyponatremia. The outcomes of interest included in-hospital mortality, common associated complications and usage of circulatory support.

Results: Among 727,629 hospital admissions for HF, 72,824 (10%) of them had an additional diagnosis of hyponatremia. The hyponatremia cohort appeared similar in age and had similar rates of Charlson comorbidity index greater than 4 (71 years vs 72 years and 33% vs 35%, respectively) compared to the non-hyponatremia cohort. The comorbidities more prevalent in patients with hyponatremia included: hypothyroidism (17% vs 21%, p<0.001), liver disease (4% vs 11%, p<0.001) and anemia (31% vs 42, p<0.001). By contrast, dyslipidemia, chronic obstructive pulmonary disease, chronic kidney disease, hypertension, diabetes mellitus, obesity, smoking status and supplemental oxygen use were comparable in both groups. ADHF patients with hyponatremia did not have higher odds of in-hospital mortality (aOR: 1.08, 95% CI: 0.98–1.19, p=0.138) when adjusted for comorbidities. Nevertheless, patients with hyponatremia had an adjusted increase in mean hospital charges of 14,731 US$ (95% CI: 11065–18397, p<0.001), length of stay by 2.6 days (95% CI: 2.5–2.8, p<0.001), usage of intra-aortic balloon pump (aOR: 1.97, 95% CI: 1.50–2.59, p<0.001) and left ventricular assist device (aOR: 2.21, 95% CI: 1.639–2.98, p<0.001), and higher incidence of acute renal failure (aOR: 1.13, 95% CI: 1.08–1.189, p<0.001) and cardiogenic shock (aOR: 1.58, 95% CI: 1.42–1.76, p<0.001) in comparison to patients without hyponatremia.

Conclusion: Multiple clinical variables excluded in the NIS dataset could have impacted the primary outcome. Clinicians who observe hyponatremia in ADHF patients should stay wary of potential side effects and maintain a low threshold to escalate care.