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Early spot urinary sodium and diuretic efficiency in acute heart failure and concomitant renal dysfunction

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Objective
In acute heart failure (AHF), early assessment of spot urinary sodium (UNa) has emerged as a useful biomarker for risk stratification and monitoring treatment response. Prior studies have shown low the utility of UNa for predicting diuretic efficiency (DE). However, this issue remains to be confirmed in patients with AHF and more severe degree of renal dysfunction. The objective of this study was to investigate whether early spot UNa predict 24-hour DE in patients with AHF and concomitant renal dysfunction (RD) at presentation.

Methods
In this is a post-hoc analysis of the IMPROVE-HF, in which 160 patients with AHF and RD (estimate glomerular filtrate rate (GFR)<60 ml/min/1.73m2) were included. DE was estimated as the net fluid output produced per 40 mg of furosemide equivalents during the first 24 hours. The association between early spot UNa and DE was evaluated by using a Multivarite linear regression analysis. Values of UNa were blinded to clinicians. The contribution of the exposure in the model’s predictability was assessed with the coefficient of determination (R2).

Results
The mean age of the study population was 78±8 years and the median (IQR) of DE, UNa, amino terminal fraction of the brain natriuretic peptide, antigen carbohydrate 125, and eGFR were 1066 (700-1667) ml, 90 mmol/L (65­111), 7765 pg/ml (3507-15404), 56 U/ml (23.6­112), and 34±8.5 ml/min/1.73m2, respectively. UNa was not correlated with 24-hour furosemide equivalent doses (Spearman's rho=−0.010, p=0.898) but were positive and moderately correlated with DE (Spearman's rho=0.333, p=0.038). In a multivariable setting, UNa was positively and non-linearly related to greater DE (p=0.001) as is shown in the figure below. UNa explained the 24.9% of the model predictability.

Conclusions
In patients with AHF and RD, spot UNa emerged as an independent predictor of 24-hour DE.
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Conclusions

In patients with AHF and RD, spot UNa emerged as an independent predictor of 24-hour DE.

Estimates of risk adjusted for age, gender, body mass index, prior known renal failure, systolic blood pressure, heart rate, rales, jugular venous distension, third sound, ascites, left ventricular ejection fraction, glomerular filtration rate, and NT-proBNP.