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Severe AKI predicts the development of acute heart failure after discharge

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Objectives: Acute kidney injury or chronic kidney disease accelerates the progression of cardiovascular disease and heart failure. We aimed to determine any comparable increase in the development of cardiovascular disease events and ESRD in AKI patients by the severity of the level of AKI (by KDIGO).

Methods: We used a database of patients who admitted to Seoul National University Bundang Hospital in 2013-2017. We divided 178430 hospitalized patients into four groups based on their AKI stage. We used multivariable-adjusted Cox proportional hazards regression models to assess the associations of AKI stage with cardiovascular disease events (acute stroke, severe arrhythmia, acute heart failure), and ESRD.

Results: With consecutive follow-up until October 2019, we observed 420 acute strokes, 4 severe arrhythmias, 1465 acute heart failures, and 10 ESRD events. Covariates for Cox proportional hazards regression models included traditional cardiovascular disease risk factors (age, sex, and BMI), baseline_eGFR, CHARLSON comorbidity index, previous diabetes, and use of NSAIDs. Severe AKI was significantly associated with a higher risk of acute heart failure (hazard ratio [HR] AKI1:1.68(95% CI,1.45-1.96), AKI2:1.74(95% CI,1.25-2.42), AKI3:1.94(95% CI,1,60-2.34)), but not an acute stroke. Association with severe arrhythmia and ESRD events were non-measurable due to lack of events.

Conclusions: Among patients with AKI, severe AKI is associated with a higher risk of acute heart failure.