

Efficacy of rapid decongestion strategy in patients hospitalized for acute heart failure

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Background: Clinical congestion is the most dominant feature in patients with acute decompensated heart failure (HF). However, uncertainty exists due to the permutations and combinations of congestion status and decongestion strategies. We aimed to investigate the impact of congestion status and its improvement on 1-year mortality.

Methods: We prospectively included 453 consecutive patients hospitalized for acute decompensated HF between July 2015 and March 2017. Congestion was evaluated using the congestion score which consists of signs and symptoms including dyspnea, fatigue, orthopnea, jugular vein distension, rales, and edema. This score ranges from 0 to 3 for each value, and calculated by summing each score. We assessed this score at admission, day 3, and discharge.

Results: The median age was 81 (interquartile range 75–87) years, and 54.1% of the subjects were male. The 1-year mortality rate was 22.7%. The congestion scores at admission, day 3, and discharge were 10.7 ± 3.9 , 3.4 ± 3.5 , and 0.3 ± 0.8 , respectively. The rate of improvement during the first 3 days was 78% and 46.6% had residual congestion, defined as scores at day 3 ≥ 3 . The score at day 3 and improvement rate during the first 3 days were related to 1-year all-cause mortality ($P < 0.001$). We examined combined predictive values by calculating multivariable-adjusted hazard ratios for associations of residual congestion and improvement rate during the first 3 days (cut-off value 64%); and prognostic variables iden-

tified by univariate Cox regression model (age, body mass index, systolic blood pressure, potassium level, albumin level, the prevalence of anemia and hypertension, left ventricular ejection fraction, ischemic etiology, previous HF hospitalization). Residual congestion and lesser improvement (% improvement $< 64\%$) were associated with higher relative risk of 1-year all-cause mortality than residual congestion and higher improvement (% improvement $\geq 64\%$) [adjusted hazard ratio (aHR) 2.33, 95% CI 1.11–4.91, $P = 0.025$], or resolved congestion (aHR 2.17, 95% CI 1.30–3.63, $P = 0.003$). Similar analysis revealed significant relationship of the score at day 3 and the rate of improvement from admission to day 3 to cardiovascular mortality. Combined predictive values of residual congestion and lesser improvement with adjustment for prognostic variables identified by univariate Cox regression model (age, body mass index, systolic blood pressure, potassium level, albumin level, the prevalence of anemia, reduced eGFR, and hypertension, left ventricular ejection fraction, ischemic etiology, previous HF hospitalization) were higher than those with residual congestion and higher improvement (aHR 3.04, 95% CI 1.15–8.03, $P = 0.025$), or resolved congestion (aHR 3.17, 95% CI 1.65–6.11, $P < 0.001$).

Conclusions: This study suggested that rapid decongestion therapy after hospital admission could be prerequisite to improve 1-year mortality in acute decompensated HF.