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Acute Kidney Injury

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Body Mass Index is Inversely Associated with Mortality in Patients with Acute Kidney Injury Undergoing Continuous Renal Replacement Therapy

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Background: Although controversial, many epidemiologic studies have shown obesity paradox. Energy consuming process can be accelerated when acute kidney injury (AKI) occurs, particularly requiring continuous renal replacement therapy (CRRT). Thus we aimed to explore whether obesity can provide survival benefit in this highly catabolic condition.

Methods: We conducted an observational study in 573 patients who underwent CRRT due to various causes of AKI between 2010 and 2014. We collected data for body mass index (BMI), Charlson comorbidity index (CCI), sepsis-related organ failure assessment (SOFA) score, CRRT prescription, and other laboratory parameters. The study end point was defined as death that occurred within 28 and 90 days of CRRT initiation.

Results: The mean age was 61.5 years and 355 (63.1%) patients were male. Patients were categorized into 4 groups by quartiles of BMI: Q1, 12.7 to 20.9; Q2, 21.0 to 23.5; Q3, 23.6 to 26.5; Q4, 26.6 to 45.3 The mean BMI was $23.9 \pm 4.3 \text{ kg/m}^2$. Patients with high BMI tended to be younger and had less septic AKI. There were no significant differences in sex, kidney function, CCI and SOFA score among 4 groups. During 28 days after CRRT initiation, 85 (59.4%) patients in the highest quartile died as compared to 106 (73.6%) patients in the lowest quartile ($P=0.012$). In a multivariable analysis adjusted for sex, blood pressure, estimated glomerular filtration rate, septic AKI, CCI, and SOFA score, highest quartile of BMI was significantly associated with a decreased risk of death [hazard ratio (HR), 0.61; 95% confidence interval (CI), 0.46 to 0.82; $P=0.001$]. when we examined 90 day mortality, this significant association remained unaltered (HR, 0.67; 95% CI, 0.50 to 0.89; $P=0.005$).

Conclusion: This study showed that high BMI conferred a survival benefit over low BMI in septic AKI patients undergoing CRRT.

Keywords: Acute kidney injury, body mass index, mortality