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## **Association Between Body Mass Index and Patient Outcome in Patients with Acute Kidney Injury Requiring Continuous Renal Replacement Therapy**

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**Objectives:** We retrospectively reviewed medical records to investigate the association between body mass index(BMI) and mortality or ESRD incidence in critically ill patients who admitted to intensive care unit (ICU) and receiving continuous renal replacement therapy(CRRT).

**Methods:** 891 adult patients were admitted to the ICU and received CRRT at three institutions of the Catholic Medical Center from July 2012 to December 2020. 845 subjects were eligible for the study, excluding patients without BMI data or patients with ECMO treatment. Patients were categorized into 4 groups according to the BMI. The association between BMI and 1-year overall mortality and 1-year ESRD incidence were investigated.

**Results:** The 1-year mortality was 43.3%, 47.9%, 36.2% and 39.0% in the underweight, normal, overweight, and obese groups respectively. The mortality rate of obese patients was significantly lower than that of normal patients in Kaplan-Meier analysis ( $p=0.002$ ). Multivariable logistic regression analysis showed that obese patients had a lower risk of mortality than normal group (hazard ratio [HR], 0.60; 95% confidence interval [CI], 0.42-0.85;  $P=0.005$ ). The 1-year ESRD incidence was 43.6%, 37.9%, 32.4% and 25.0% in the underweight, normal, overweight, and obese groups respectively. In a multivariable logistic regression analysis adjusted for confounding factors, obesity was associated with a decreased risk of ESRD (HR, 0.56; 95% CI, 0.34-0.92;  $P=0.023$ ). In subgroup analysis according to age, 1-year mortality consistently showed an inverse correlation between BMI and mortality, but ESRD incidence was inversely related with obesity only in patients with age > 65. There was no significant difference among the 4 groups according to BMI in CRRT duration, ICU length of stay, hospital length of stay and CRRT restart.

**Conclusions:** In critically ill patients admitted to ICU with AKI requiring CRRT, obesity (BMI>25.0kg/m<sup>2</sup>) was associated with lower 1-year mortality and 1-year ESRD incidence, suggesting obesity paradox in patient survival and renal survival.

Figure 1. Flow chart of the study cohort