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Impact of mean arterial pressure on mortality in patients undergoing continuous renal replacement therapy

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Objectives: Although patients undergoing continuous renal replacement therapy (CRRT) due to acute kidney injury frequently have instability in mean arterial pressure (MAP), no consensus exists on the target of MAP related to high mortality after CRRT.

Methods: A total of 2,211 patients who underwent CRRT due to AKI in three referral hospitals were retrospectively reviewed. The MAPs were divided into tertiles, and the 3rd tertile group served as a reference in the analyses. The major outcome was all-cause mortality during the intensive care unit (ICU) period. The odds ratio (OR) of mortality was calculated using the logistic regression after adjustment of multiple covariates. The non-linear relationship regression model was applied to determine the threshold value of MAP related to increasing mortality.

Results: The mean value of MAP was 80.7 ± 17.3 mmHg at the time of starting CRRT. During 5 days of the median ICU stay (interquartile range, 2–12 days), 1,227 (55.5%) patients died. The 1st tertile group of MAP showed an elevated risk of mortality than the 3rd tertile group (adjusted OR, 1.29 [1.03–1.61]; $P = 0.027$). In the non-linear regression analysis, the threshold value of MAP was calculated as 78.0 mmHg. Patients with MAP < 78.0 mmHg had a higher mortality rate than those with ≥ 78.0 mmHg (adjusted OR, 1.23 [1.02–1.47]; $P = 0.029$).

Conclusions: Low MAP at the time of starting CRRT is related with the risk of ICU mortality, particularly when it is < 78.0 mmHg. This can be used as a risk classification and potential target of therapies.