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Low mean blood pressure as a risk factor of short-term and long-term mortality in patients undergoing continuous renal replacement therapy

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Objectives: Maintenance of mean arterial pressure (MAP) is an important issue to prevent tissue hypoxia in patients with acute kidney injury (AKI). Although patients undergoing continuous renal replacement therapy (CRRT) frequently show instability in MAP, there is no consensus on what the target of MAP is to reduce mortality at the time of starting CRRT. Herein, we aimed to investigate the relationship of MAP with all-cause mortality after CRRT.

Methods: A total of 1,490 patients who underwent CRRT due to AKI between 2010 and 2016 years were reviewed. Their MAPs were divided into tertiles, and the 3rd tertile group served as a reference in the analyses. The hazard ratio (HR) and odds ratio (OR) of mortality were calculated using Cox and logistic regression models after adjustment of multiple covariates.

Results: The mean value of MAP was 81 ± 17.4 mmHg at the time of starting CRRT. The median duration of CRRT application was 3 [interquartile range, 1 to 7] days. During this period, 900 (60.4%) patients died during CRRT. The 1st tertile group of MAP showed an elevated risk of mortality than the 3rd tertile group (adjusted HR, 1.3 [1.13–1.53]; $P = 0.001$). When the mortality rates were stratified by the timeframe, the 1st tertile group had higher ORs of mortality than the 3rd tertile group as following adjusted ORs: 1.4 (1.03–1.78) in 2 weeks; 1.4 (1.07–1.87) in 1 month; 1.5 (1.11–1.98) in 6 months; and 1.5 (1.09–1.94) in 1 year.

Conclusions: Low MAP at the time of starting CRRT is related with the risk of both short-term and long-term mortality. Accordingly, awareness of low MAP should be raised in the patients starting CRRT due to AKI.