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Impact of renal replacement therapy on renal outcome and mortality in critically ill patients with acute kidney injury

Subin Hwang[1], Hyejeong Park[3], Danbee Kang[3], Junseok Jeon[2], Juhee Cho[3], Jung Eun Lee[2], Wooseong Huh[2], Yoon-Goo Kim[2], Dae Joong Kim[2], Hye Ryoun Jang[2]
[1]Department of Internal Medicine-Nephrology, Inje University Seoul Paik Hospital, Korea, Republic of
[2]Department of Internal Medicine-Nephrology, Samsung Medical Center, Korea, Republic of
[3]Department of Center for Clinical Epidemiology, Samsung Medical Center, Korea, Republic of

Objectives: Despite abundance in reports regarding the clinical significance of renal replacement therapy (RRT) in critically ill patients with acute kidney injury (AKI), studies focusing on renal and patient outcomes depending on the type of RRT or preexisting renal disease are scarce. The clinical impact of RRT in a nationwide cohort of critically ill patients with AKI was evaluated.

Methods: All adult AKI patients who received RRT during their intensive care unit stay in Korea from 2008 to 2015 were screened using the national health insurance review and assessment database. A total of 124,182 patients were included. Patients were divided into three groups: control (no RRT), dialysis (hemodialysis or peritoneal dialysis), and CRRT groups. In-hospital mortality and progression to end-stage of renal disease (ESRD) were analyzed depending on the preexisting renal disease.

Results: Compared to the control group, dialysis and CRRT groups were more likely to have a history of renal disease. Among 21,165 patients with a history of renal disease, dialysis group had a lower risk of in-hospital mortality compared to the CRRT group. The incidence of ESRD was higher in the dialysis and CRRT groups compared to the control group (control vs. dialysis vs. CRRT, 16.2 vs. 463.8 vs. 126.5 per 1,000 person-years). Compared to the control group, the fully-adjusted hazard ratios (HR) for ESRD were 17.67 (15.06-20.72) and 7.28 (6.29-8.41) in the dialysis and CRRT groups, respectively. The association between RRT and the development of ESRD was consistent in both RRT groups and HR was even higher in patients without preexisting renal disease.

Conclusions: We demonstrated that severe AKI requiring RRT is a potent risk factor of ESRD even in patients without preexisting renal disease and RRT modality may be a surrogate marker of in-hospital mortality in critically ill patients with AKI.