KSN 2018
Seoul, Korea · May 17 - 20

Abstract Type : Poster
Presentation No. : PAK 025

Predictive factors for successful discontinuation of continuous renal replacement therapy in acute kidney injury

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Objectives: Although continuous renal replacement therapy (CRRT) is a standard treatment for severe acute kidney injury (AKI) in critically ill patients, the strategy for discontinuing CRRT is sparse. Predictive factors for successful discontinuation of CRRT was evaluated.

Methods: Adult patients (≥18 years) who received CRRT at Samsung Medical Center from June 2007 to June 2017 were included (n=3060). Patients with preexisting end stage renal disease (ESRD), patients who progressed to ESRD within 1 year after CRRT discontinuation, or died within 7 days were excluded. Successful discontinuation of CRRT was defined as no requirement of RRT for 7 days after stopping CRRT. Patients were divided into the failure group and the success group. Clinical information and laboratory results were collected by using electronic medical records.

Results: A total of 1017 patients were analyzed. Baseline serum creatinine was lower in the success group (failure vs. success: 3.52±2.29 vs. 2.90±2.11 mg/dL, $p<0.001$). Urine output at CRRT initiation was higher in success group (397 vs. 650 mL/day, $p<0.001$). There were no differences in comorbidities. The duration of CRRT was longer in the failure group ($p<0.001$). Mean arterial pressure on discontinuation day (D0) was lower in the success group (80.7 ± 12.6 vs. 78.5 ± 12.8 mmHg, $p=0.006$). Urine output on the day before discontinuation (D-1) (134 vs. 612 mL/day, $p<0.001$) and D0 (250 vs.1255 mL/day, $p<0.001$) and the proportion of patients who received vasopressors on D-1 (26.0% vs. 39.2%, $p<0.001$) and D0 (19.0% vs. 33.9%, $p<0.001$) were higher in the success group. Serum potassium on D-1 (4.01 ± 0.45 vs. 3.93 ± 0.48, $p=0.005$) and D0 (4.02 ± 0.44 vs. 3.89 ± 0.45, $p<0.001$) was lower in the success group.

Conclusions: Our study identified greater urine output, use of vasopressors, and lower but normal potassium levels as predictive factors of successful CRRT discontinuation.