

Abstract Submission No.: A-0484

**Clinical Significance of Urine Output at Continuous Renal Replacement
Therapy Discontinuation on 1-year Mortality and Renal Outcome in Critically
Ill Patients with Acute Kidney Injury**

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Objectives : Continuous renal replacement therapy (CRRT) plays a crucial role in critically ill patients with acute kidney injury (AKI). However, the predictive value of urine output (UO) for long-term prognosis after CRRT discontinuation is not fully understood.

Methods : This retrospective study included AKI patients undergoing CRRT at three tertiary hospitals. Patients were categorized into four groups based on 24-hour UO at the time of CRRT discontinuation. All-cause mortality and the development of end-stage kidney disease (ESKD) one year after CRRT discontinuation were analyzed.

Results : Among 852 patients, 61.4% were male, the mean age was 63.7 ± 16.0 years. During one year after CRRT discontinuation, 334 (39.2%) of 852 patients died, and 150 (30.1%) of 499 patients were diagnosed with ESKD. Multivariable analysis revealed that UO <1500 ml/day was associated with a higher risk for all-cause mortality (UO <100 ml/day: hazard ratio (HR) 3.06, 95% confidence interval (CI) 2.22–4.22; $P < 0.01$, UO 100–499.9 ml/day: HR 2.23, 95% CI 1.57–3.16; $P < 0.01$, UO 500–1499.9 ml/day: HR 1.70, 95% CI 1.18–2.44; $P = 0.01$), and for the development of ESKD (UO <100 ml/day: odd ratio (OR) 16.17, 95% CI 7.67–34.09; $P < 0.01$, UO 100–499.9 ml/day: OR 7.50, 95% CI 3.48–16.18; $P < 0.01$, UO 500–1499.9 ml/day: OR 3.40, 95% CI 1.54–7.48; $P < 0.01$) after adjusting for confounding variables. UO was negatively associated with the risk of ESKD, irrespective of diuretics use.

Conclusions : This study underscores the importance of monitoring UO in predicting long-term risks of ESKD and mortality in critically ill AKI patients undergoing CRRT.

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Table 3. Factors associated with the development of end-stage kidney disease at one year

| | No. of patients | No. of events (%) | OR (95% CI) | P value |
|-------------------------------|-----------------|-------------------|---------------------|---------|
| Age (year) ^a | 484 | 51 (10.5) | 1.02 (1.00, 1.04) | 0.02 |
| Diabetes | | | | |
| No | 367 | 37 (10.1) | Ref. | |
| Yes | 117 | 14 (12.0) | 2.73 (1.55, 4.81) | <0.01 |
| Hypertension | | | | |
| No | 315 | 34 (10.8) | Ref. | |
| Yes | 169 | 17 (10.1) | 2.70 (1.57, 4.65) | <0.01 |
| Serum Cr (mg/dL) ^b | 484 | 51 (10.5) | 1.68 (1.29, 2.18) | <0.01 |
| Urine output (ml/day) | | | | |
| ≥1500 | 171 | 11 (6.4) | Ref. | |
| 500–1499.9 | 96 | 15 (15.6) | 3.40 (1.54, 7.48) | <0.01 |
| 100–499.9 | 97 | 10 (10.3) | 7.50 (3.48, 16.18) | <0.01 |
| <100 | 120 | 15 (12.5) | 16.17 (7.67, 34.09) | <0.01 |

* Adjusted odd ratios and P values were estimated with the use of logistic-regression model. Model included age, sex, urine output, BMI, diabetes, hypertension, sepsis, cardiorenal syndrome, cardiovascular operation, liver transplantation, MBP, use of diuretics, duration of CRRT administration, hemoglobin, albumin, serum Cr, and arterial pH.

^a Every 1-year increase ^b Every 1 mg/dL increase

Abbreviation: BMI, body mass index; CI, confidence interval; Cr, creatinine; CRRT, continuous renal replacement therapy; MBP, mean blood pressure; OR, odd ratio; Ref., reference