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Mortality prediction of serum neutrophil gelatinase-associated lipocalin in patients requiring continuous renal replacement therapy

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Objectives: We investigated whether serum neutrophil gelatinase-associated lipocalin (NGAL) can predict mortality in patients with acute kidney injury (AKI) requiring continuous renal replacement therapy (CRRT).

Methods: This study enrolled 169 patients who underwent serum NGAL testing at CRRT initiation from June 2017 to January 2019. The predictive power of serum NGAL level for 28-day mortality was compared to the Acute Physiology and Chronic Health Evaluation-II (APACHE-II) score and Sequential Organ Failure Assessment (SOFA) score via area under the receiver operating characteristic curve (AuROC) value.

Results: There were 55 survivors and 114 non-survivors at 28 days post-CRRT initiation. Median serum NGAL level was significantly higher in the non-survivor group than in the survivor group (743.0 vs. 504.0 ng/mL, $P=0.003$). The AuROC value of serum NGAL level was 0.640, which was lower than APACHE-II score and SOFA score values (0.767 and 0.715, respectively). However, in the low APACHE-II score group (<27.5), AuROC value of serum NGAL was significantly increased (0.698), and it was an independent risk factor for 28 day-mortality (hazard ratio 2.405, 95% confidence interval (1.209-4.783), $P=0.012$).

Conclusions: In patients with AKI requiring CRRT, serum NGAL levels may be useful for predicting short-term mortality in those with low APACHE-II scores.

Table

Table. Multivariate Cox proportional hazard regression analysis of 28-day mortality in the low APACHE-II score group

	β	Hazard ratio (95% confidence interval)	P-value
NGAL \geq 511.5 ng/mL	0.878	2.405 (1.209–4.783)	0.012
APACHE-II score \geq 23.5	0.829	2.291 (1.173-4.472)	0.015

Multivariate regression model was adjusted with parameters showing significant difference between the survivor and non-survivor groups. Parameters were as follows: NGAL group according to cutoff value (511.5ng/mL), APACHE-II score group according to cutoff value (23.5), SOFA score group according to cutoff value (10.5), age, inotropic agent administration, and indication for CRRT initiation (sepsis).

Figure

Figure. Predictive value for 28-day mortality of serum NGAL level, APACHE-II score, and SOFA score in low APACHE-II score group

