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The Predictive Value of a Composite Inflammatory-Metabolic Index for In-Hospital Mortality in Patients Undergoing CKRT

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Objectives : This study aimed to evaluate the prognostic value of the Lactate–CRP/Albumin Ratio (L-CAR)—a composite inflammatory-metabolic index—at the time of continuous kidney replacement therapy (CKRT) initiation for predicting in-hospital mortality in critically ill patients with acute kidney injury (AKI).

Methods : We conducted a retrospective observational study of 177 patients who initiated CKRT between January 2020 and September 2021 at a tertiary care university hospital. Patients with pre-existing end-stage kidney disease receiving maintenance hemodialysis were excluded. Clinical characteristics and laboratory parameters, including lactate, C-reactive protein (CRP), and albumin, were collected at the onset of CKRT. The L-CAR was calculated using the following formula: $[\text{Lactate (mmol/L)} \times \text{CRP (mg/dL)}] / \text{Albumin (g/dL)}$ and expressed as a dimensionless index.

Results : Of the 177 patients, 83 (46.9%) died during hospitalization. The non-survivor group exhibited significantly higher lactate levels and lower nutritional markers (total protein and albumin) compared to the survivor group ($P < 0.05$). Notably, the non-survivor group also had significantly lower baseline creatinine levels, suggesting a potential loss of muscle mass or reduced production. The L-CAR was markedly higher in patients who died ($P < 0.001$). Multivariable Cox proportional hazards analysis revealed that L-CAR was independently associated with in-hospital mortality (Adjusted Hazard Ratio [aHR] 1.013 ; $P < 0.05$) after adjusting for age, sex, PaO_2 , serum creatinine, sodium, and potassium level. [Figure 1]

Conclusions : The L-CAR measured at CKRT initiation is a potent and independent predictor of in-hospital mortality in critically ill patients. By integrating metabolic stress (lactate), systemic inflammation (CRP), and nutritional reserve (albumin), this simple composite biomarker provides a robust tool for early risk stratification and clinical decision-making in the management of patients undergoing CKRT.

Figure 1.png



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