



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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The High Estimated Glomerular Filtration Rate Paradox In Contrast-Induced Acute Kidney Injury In Emergency Department Patients

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Objectives : Contrast-induced acute kidney injury (CI-AKI) is associated with adverse clinical outcomes. Although reduced renal function is a well-known risk factor, the relationship between baseline estimated glomerular filtration rate (eGFR) and CI-AKI risk in emergency department patients remains unclear. This study aimed to identify predictors of CI-AKI and evaluate its risk across baseline eGFR stages in patients undergoing contrast-enhanced imaging in the emergency department.

Methods : We conducted a retrospective cohort study of adults undergoing contrast-enhanced computed tomography or coronary angiography in the emergency department between January 2024 and December 2025. Patients with available pre- and post-contrast creatinine measurements were included, while those with baseline eGFR <15 mL/min/1.73 m² were excluded. CI-AKI was defined as an increase in serum creatinine ≥25% or ≥0.5 mg/dL within 48–72 hours after contrast exposure. Logistic regression analysis was performed to identify predictors of CI-AKI and evaluate risk across baseline eGFR stages.

Results : Among 2,829 patients, 280 developed CI-AKI. Higher serum creatinine was independently associated with increased CI-AKI risk (adjusted OR 1.532, p<0.001), whereas BUN showed an inverse association (adjusted OR 0.975, p<0.001). CI-AKI risk demonstrated a nonlinear pattern across eGFR stages. Patients with severe renal impairment (eGFR 15–29 mL/min/1.73 m²) had significantly increased risk compared with the reference group (OR 2.029, p=0.002). Notably, patients with eGFR ≥90 mL/min/1.73 m² also showed increased risk (OR 1.405, p=0.038), indicating a paradoxical dual-risk pattern. This finding may reflect overestimation of renal function in patients with low muscle mass or acute illness.

Conclusions : CI-AKI risk demonstrated a paradoxical pattern across eGFR stages, with increased risk observed in both severe renal dysfunction and high eGFR. These findings suggest that CI-AKI risk cannot be adequately assessed using a simple eGFR cutoff alone. Integrated risk assessment incorporating renal function stage and clinical context may improve risk stratification in emergency department settings.

eGFR-odds ratio.png



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eGFR Stage (mL/min/1.73 m ²)	Odds Ratio	95% CI	P value
≥90	1.405	1.018–1.939	0.038
30–59	1.018	0.686–1.510	0.931
15–29	2.029	1.301–3.165	0.002

Reference group: eGFR 60–89 mL/min/1.73 m².

eGFR-odds ratio.png

Odds Ratios for CI-AKI According to Baseline eGFR Stage

