# Early Acute Kidney Injury based on Serum Creatinine or Cystatin C in Intensive Care Unit after Major Trauma

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## Abstract

**Background**: Acute kidney injury (AKI) is a common problem in critically ill patients and is independently associated with increased morbidity and mortality. Recently, serum cystatin C has been shown to be superior to creatinine in early detection of renal function impairment. We compared estimated GFR based on serum cystatin C with estimated GFR based on serum creatinine for early detection of renal dysfunction according to the RIFLE criteria.

**Methods**: During 9 months, three hundred post trauma patients that were referred to the intensive care unit of a referral trauma hospital were recruited. Serum creatinine and serum cystatin C were measured and the estimated GFR within 24 hours of ICU admission was calculated. The primary outcome was the incidence of AKI according to the RIFLE criteria within 2$^{nd}$ to 7$^{th}$ day of admission.

**Results:** During the first week of ICU admission,21% of patients experienced AKI. After adjusting for major confounders, only the patients with first day's serum cystatin level higher than 0.78 mg/l were at higher risk of first week AKI (OR=6.14, 95% CI: 2.5-14.7, P<0.001). First day's serum cystatin C and injury severity score were the major risk factors for ICU mortality (OR=3.54, 95% CI: 1.7-7.4, P=0.001) and (OR=4.6, 95% CI: 1.5-14, P=0.007), respectively.

**Conclusion**: Within 24 hours after admission in ICU due to multiple trauma, high serum cystatin C level may have prognostic value in predicting early AKI and mortality during ICU admission. However, such correlation was not seen neither with creatinine nor cystatin C based GFR.

**Keywords:** Acute kidney injury, Trauma, Cystatin C, Creatinine, Glomerular filtration rate