Cystatin C as a Predictor of Contrast-induced Nephropathy in Critically-ill Patients

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ABSTRACT

Background: Contrast-induced nephropathy (CIN) is a leading cause of acute kidney injury (AKI) in hospitalized patients and is associated with considerable morbidity and mortality. An increased serum creatinine level to define kidney injury is a poor marker. Although current evidence is conflicting, Cystatin C has been suggested to be a more sensitive early marker of AKI.

Objective: To evaluate Cystatin C as a marker of CIN in intensive care unit (ICU) patients administered with contrast media for diagnostic or therapeutic intervention.

Design: A prospective study.

Setting: Intensive Care Unit (ICU), King Abdul-Aziz University Hospital.

Method: A prospective study involving laboratory investigations: urea, creatinine, serum electrolytes, Cystatin-C and lactic acid were performed on 84 patients admitted to ICU from January 2010 to December 2011.

Result: During the 72 hour post-contrast follow-up period, 21 (25%) patients developed CIN; 14 (66.7%) on day one, 4 (19%) on day two and 3 (14.3%) on day three. Cystatin C levels pre-contrast administration were significantly higher in patients who developed CIN compared to those who did not (p=0.012). There were significant increases in Cystatin C and urea levels in CIN groups at 24-48 and 24-72 hours post-contrast. Creatinine levels in CIN group increased significantly at 72 hours post-contrast (p=0.009). Mortality rate was significantly high in CIN patients (p=0.038) irrespective of the lengths of hospital or ICU stay.

Conclusion: The incidence of CIN in ICU patients is fairly high and is associated with increased mortality. Cystatin C may represent a useful biomarker for prediction and early detection of CIN.