ASSESSMENT OF BIOCHEMICAL MARKERS IN EARLY POST-BURN PERIOD FOR PREDICTION OF ACUTE KIDNEY INJURY AND MORTALITY IN PATIENTS WITH MAJOR BURN INJURY: COMPARISON OF SERUM CREATININE, SERUM CYSTATIN-C, SERUM AND URINE NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN (NGAL) (086)

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Mortality rate among burned patients who developed acute kidney injury (AKI) was reported between 28% and 100% and was 50% to 100% among those who were treated with renal replacement therapy. Recently, serum cystatin C, serum Neutrophil gelatinase-associated lipocalin (NGAL) and urine NGAL is introduced as an early biomarker for AKI which rises 24-48 hr before the rise of serum creatinine. The objectives of this study is to estimate the diagnostic utility of cystatin C, serum NGAL and urine NGAL in early post burn period as a biomarker for predicting acute kidney injury and mortality in patients with major burn injury.

From May 2011 to July 2012, total 90 consecutive patients with burn wound over 20% of total body surface area were enrolled to this study. Whole blood and urine samples were obtained to measure serum creatinine, serum cystatin C, urine and serum NGAL at 0hr, 3hr, 6hr, 12hr, 24hr and 48hr from admission. Receiver operating characteristic curves, area under the curve (AUC) and multivariate logistic regression analysis was performed to assess the predictive value of the biomarkers on AKI and mortality.

In all period, serum creatinine and serum NGAL and urine NGAL were significantly higher in early AKI group than non-AKI group. But cystatin C was significantly higher only in 12 and 24 hr from injury comparing between early AKI group and non-AKI group. When we compared each biomarker between non-AKI group and late AKI group, serum creatinine and cystatin C had no differences in all period. But serum NGAL and urine NGAL had a significant difference between non-AKI group and late AKI group only in hyper-acute period. (serum NGAL: 0hr, 3hr and 6hr from injury; urine NGAL: 0hr and 3hr from injury)

In multivariate logistic regression analysis, all the variables including Age, % TBSA burned, Sex, Inhalation injury, Serum creatinine, Serum cystatin C, Serum NGAL, Urine NGAL were independently associated with AKI development. And age, sex, % TBSA burned, serum NGAL, urine NGAL were independently associated with mortality. But Inhalation injury, serum creatinine and serum cystatin C were not independently associated with mortality.

When the patient maintain high level of serum NGAL and urine NGAL until 12 hours from admission, the patient has a risk of developing early AKI and early mortality with burn shock in massively burned patient. However, serum NGAL and urine NGAL in early post-burn period fail to predict the late AKI and non-burn shock mortality in this study. None the less, serum NGAL and urine NGAL had an independent association with AKI development and mortality within 48 hours from admission.