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The value of urinary NGAL compared to serum creatinine level in predicting acute kidney injury among neonates

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Introduction: The diagnosis of acute kidney injury is based on calculating glomerular filtration rate rely on serum creatinine, however this method seems to be unreliable due to potential effects of underlying confounding parameters. Thus, recent efforts have been focused on new diagnostic specific markers with high sensitivity and accuracy for early prediction of acute kidney injury. Recent results identified NGAL as a widespread and sensitive response to established AKI in humans. However, the role of this marker to early predict acute kidney injury in children remains uncertain. The present study aimed to assess and compare the level of urinary NGAL in neonates with acute kidney injury and those without kidney injury admitted to neonatal intensive care unit.

Methods: This cross-sectional study was performed on 75 consecutive neonates who were hospitalized because of acute kidney injury. Among neonates admitted to hospital due to causes unrelated to kidney disease (with normal serum creatinine level) were randomly selected as the control (n=81). In both groups and on admission, the urine levels of creatinine and NGAL were measured. The level of creatinine was assessed by enzymatic method and the level of NGAL was measured using ELISA method. The level of urine creatinine was measured at two time points.

Results: The mean level of NGAL was 825.81 ± 175.08 ng/ml in case group and 292.20 ± 322.03 ng/ml in control group with a significant difference. NGAL had a sensitivity of 100%, a specificity of 55.6%, a positive predictive value of 67.6%, a negative predictive value of 100%, and an accuracy of 76.9% to predict acute kidney injury. Assessing the area under the ROC curve showed that the measurement of NGAL could effectively discriminate acute kidney injury from normal condition (AUC=0.899). The best cutoff value for NGAL to predict acute kidney disease among neonates was estimated to be 427 ng/ml yielding a sensitivity of 100% and a specificity of 67.9%. The Pearson's correlation test showed a strong linear association between the level of NGAL and the changed level of creatinine ($r=0.395$, $p<0.001$).

Conclusion: The measurement of NGAL has a high sensitivity and proper specificity compared to creatinine level in predicting acute kidney injury among neonates.

Biography

Mahdi Mashaiekh has completed MD at Isfahan University, Pediatrics in 2009 at Tehran University of Medical Sciences and Neonatology in 2016 at Iran University of Medical Sciences. He has published 5 papers in medical journals.

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