

## Newer markers and Calculated Acute Kidney Injury score: better diagnostic accuracy for AKI in children with chronic Liver Disease ( CLD ) and portal hypertension ( PHTN )

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### ABSTRACT:

For diagnosing Acute Kidney Injury ( AKI ) newer biomolecules such as serum cystatin C and urinary neutrophil gelatinase-associated lipocalin ( NGAL ) are more accurate in estimating GFR. Renal resistive index [RRI] is early marker of AKI in cirrhotics. There is limited data on these markers in pediatric liver disease. This study was planned to study the diagnostic value of the serum cystatin C, urinary NGAL and RRI in AKI amongst pediatric CLD with PHTN. Prospective observational study in which all patients of CLD with PHTN with or without AKI were enrolled and followed up for 6 months for development/resolution of AKI as per Kidney Diseases–Improving Global Outcomes ( KDIGO definition. AKI score was calculated using newer markers. Of the 100 children enrolled, 41 ( 16.5% ) had AKI. Mean age at AKI was  $8 \pm 5.4$  years and PELD/MELD of  $30 \pm 12$ . Among AKI group median ( IQR ) values of serum urea ( mg/dl ), serum creatinine value ( mg/dl ), serum cystatin C ( mg/L ), urinary NGAL ( ng/ml ) and RRI was significantly higher than in non AKI group. ROC analysis showed best cut off of 0.97 mg/L of serum cystatin C, 101 ng/ml of urinary NGAL and 0.8 for RRI had maximum sensitivity, specificity and diagnostic accuracy. On logistic regression analysis including all three markers only serum cystatin C and urinary NGAL was found to be significant and AKI score formula was calculated as [AKI score:  $-7.34 + 6.3$  ( Cystatin in mg/L ) +  $0.006$  ( Urinary NGAL in ng/ml )]. ROC analysis of the calculated AKI score showed that the cutoff of -0.5 has sensitivity, specificity, positive likelihood ratio, negative likelihood ratio and diagnostic accuracy of 82.9%, 83.1%, 3.57, 0.17 and 83% respectively with AUROC of 0.855. On applying AKI-score on those who did not fulfill the definition of AKI at baseline as per KDIGO, we identified 10 additional cases of AKI, and 7 of whom either died or had liver transplant. Conclusion: Calculated AKI score is better tool to identify early AKI as compare to serum cystatin C, urinary NGAL, RRI and KDIGO definition.

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