URINARY NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN IN THE ONSET OF CHRONIC KIDNEY DISEASE IN CHILDREN: A SYSTEMATIC REVIEW AND META-ANALYSIS

Paula Bianca B. Martillo - Pelinio, MD, Alona A. Briones, MD
Philippine Children's Medical Center

INTRODUCTION

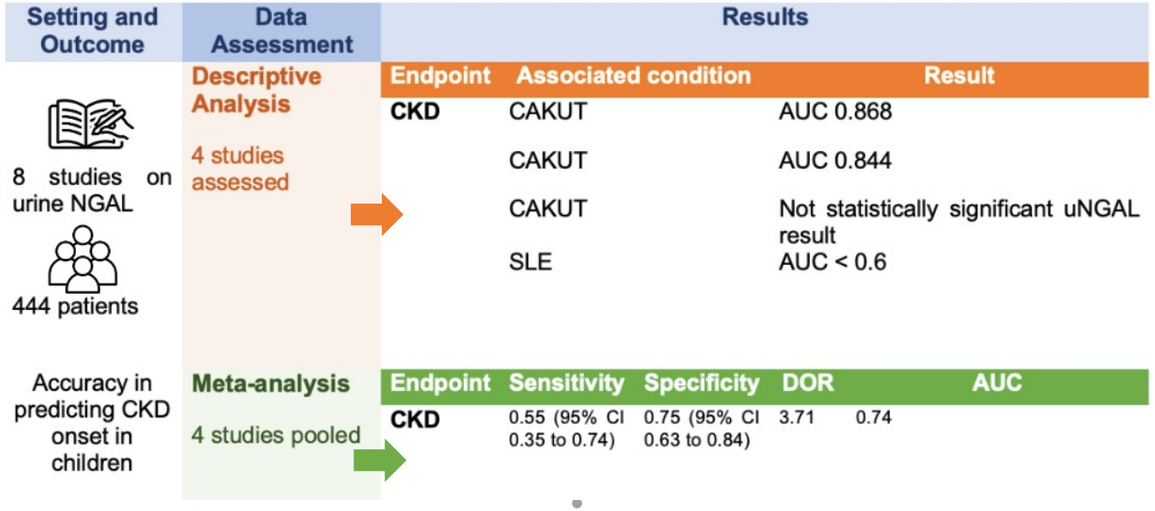
Chronic kidney disease (CKD) is a devastating illness. The prevalence of pediatric CKD ranges from 15 to 74.7 cases per 1 million children, and the mortality among those who progress to ESRD is 30 to 50 times higher compared to that in the general population.

If the disease is diagnosed in the early stage, disease progression can be prevented. Neutrophil gelatinase-associated lipocalin (NGAL) has recently been proven to be a useful marker in CKD and it has the potential to be an ideal biomarker in the early detection of CKD.

The usefulness of urinary NGAL (uNGAL) for predicting the onset of chronic kidney disease (CKD) in children has not been fully evaluated. We sought to quantitatively summarize published data to examine the accuracy of uNGAL to determine the onset of renal damage among children at risk.

METHODS

A systematic review of the literature was performed. Automated search for electronic literature on articles through Pubmed and Cochrane Library databases, up to August 2022. Included studies measured urine NGAL levels in children with primary kidney disease and/or systemic diseases affecting the kidneys; and history of AKI. We calculated the sensitivity, specificity, and diagnostic odds ratio for statistical analysis. QUADAS-2, RevMan 2011, and Stata MP version 17.0 were used for statistical analysis.



RESULTS

8 studies were analyzed, which included 444 participants. 4 studies were analyzed descriptively. The AUC for uNGAL/cr was 0.868 (95% CI 0.796–0.939) and 0.844 (95% CI 0.79–0.89) for kidney injury for the 2 studies involving children with CAKUT. 1 study on CAKUT had insignificant results, and 1 study on lupus nephritis had AUC ≤ 0.60.

The remaining 4 studies were included in the quantitative synthesis. A total of 202 patients were enrolled in the 4 studies. The pooled specificity and sensitivity of the four studies are 0.75 (95% CI 0.63 to 0.84) and 0.55 (95% CI 0.35 to 0.74), respectively. The pooled AUC is 0.74 (95% 0.70 to 0.78), which suggests that NGAL is an *acceptable* diagnostic test in predicting the onset of CKD in children.

CONCLUSION

The data suggest that uNGAL is an acceptable diagnostic test in predicting the onset of CKD in children for clinical practice and research but requires more prospective validation.

KEYWORDS

Chronic kidney disease . CKD . Urine or urinary Neutrophil gelatinase-associated Lipocalin protein . uNGAL