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Correlation of renal echogenicity with renal pathology and function

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Objectives : Renal ultrasonography has been widely used in children with renal disease. However, whether the increase in kidney ultrasound well reflects the histological results of the kidney is not defined. Also, it is difficult to explain the relationship between renal echogenicity and renal function in children.

Methods : This retrospective study was conducted with 75 patients with several renal diseases in konkuk university medical center from August 2005 to November 2015. This study was designed to correlate the findings of the renal sonography with laboratory results (urine albumin and estimated glomerular filtration rate(eGFR)) and pathologic findings. Renal echogenicity was scored on 1 to 3 basis by comparing renal echogenicity to the adjacent liver; grade I : the renal echogenicity was less than that of the liver; grade II : the renal echogenicity equaled that of the liver; grade III : the renal echogenicity was greater than that of the liver. Three histologic characteristics were evaluated: glomerular alterations, interstitial infiltration and tubular atrophy. These were measured 0 to 4 dependent on the increasing severity.

Results : Renal echogenicity revealed the positive correlation with interstitial infiltration ($r = 0.259$, $P = 0.025$), and tubular atrophy ($r = 0.268$, $P = 0.02$) of pathologic findings. Renal echogenicity had the positive correlation with microalbuminuria ($r = 0.283$, $P = 0.014$), but the negative correlation with eGFR ($r = -0.352$, $P = 0.002$).

Conclusions : Increased renal echogenicity suggest the interstitial infiltration and tubular atrophy of pathologic findings. Also, it relates to increased urine albumin excretion and decreased eGFR. Increased renal echogenicity was useful to predict the status of renal pathology and function.

Keywords : RENAL ECHOGENICITY, RENAL PATHOLOGY, RENAL FUNCTION