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Clinical usefulness of contrast-enhanced computed tomography in patients with nonobstructive acute pyelonephritis-associated acute kidney injury

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Objectives: The aim of this study is to investigate the clinical utility of contrast-enhanced computed tomography (CE-CT) in patient with nonobstructive acute pyelonephritis (APN).

Methods: From 2007 to 2013, 540 APN patients who underwent a CE-CT scan within 24 hours after hospital admission were enrolled. We divided these patients into greater (50% or greater involvement, n=141) and lesser (less than 50% involvement, n=399) groups based on renal parenchymal involvement in CE-CT examination. We compared clinical characteristics between two groups and analyzed the clinical value of CE-CT scan as a prognostic factor for predicting acute kidney injury (AKI) in patient with nonobstructive APN.

Results: The mean age of these patients was 55.2 ± 17.8 years and 93.7% were women. The mean estimated glomerular filtration rate was 70.3 ± 4.7 mL/min/1.73m². Compared with patients in lesser group, the patients in greater group had lower serum albumin levels (3.51 ± 0.50 vs 3.88 ± 0.63 , $p < 0.01$) and longer hospital stay (10.19 ± 4.73 vs 8.90 ± 4.48 , $p = 0.004$). In addition, AKI (22.0% vs 12.3%, $p < 0.005$) and bacteremia (35.5% vs 27.1%, $p = 0.039$) were frequently developed in greater group, respectively. The overall incidence of AKI was 14.2%, of which 8.7%, 4.9% and 0.6% were classified as risk, injury and failure, respectively, according to RIFLE criteria. In a multivariate logistic regression analysis for predicting AKI, age, serum albumin, leukocyte and the presence of renal parenchymal involvement of greater than 50% were significant predictors of AKI.

Conclusions: The CE-CT scan could be useful to predict the clinical severity and course including AKI in patients with nonobstructive APN.