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Long-term outcomes of acute tubular necrosis and acute tubulointerstitial nephritis

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Objectives: Renal damage of acute tubular necrosis (ATN) and acute tubulointerstitial nephritis (ATIN) are considered reversible. However, the prevalence and long-term outcome of ATN and ATIN were unknown.

Methods:
We included 4690 adult patients who had undergone kidney biopsy in Korea University Anam hospital (2001-2017) and Seoul National University (1979-2008). We excluded patients with biopsy confirmed end stage renal disease (ESRD), previous kidney transplantation, malignancy, and inadequate biopsy specimen.

Results:
Mean age was 39.0±15.5 years and 55% was male. Primary glomerulonephritis (PGN) was 3466 (65.4%), secondary glomerulonephritis (SGN) was 1088 (20.5%), and ATN or ATIN was 136 (2.6%). Patients with ATN or ATIN were significantly older compared than PGN or SGN (P<0.001) and had lower eGFR (P<0.001; 31.9±28.0, 74.5±36.6, and 70.9±38.5ml/min/1.73m², respectively). Mortality was the highest in patients with SGN (18.0%). Mortality was 8.7% in patients with PGN, and 7.4% in ATN or ATIN (P<0.001). ESRD was developed in 2.9% of patients with ATN or ATIN. The incidence of ESRD was much lower in patients with ATN or ATIN compared than PGN (14.4%) or SGN (15.0%) (P=0.001). During 156.8±101.8 months follow up period, the adjusted risk of mortality was higher in patients with SGN compared than PGN (RR 2.156; 95% CI, 1.795-2.590). However, risk of mortality was not significantly different between PGN and ATN or ATIN. The adjusted risk of ESRD was significantly lower in patients with ATN or ATIN compared than PGN, and the risks of ESRD was not different between PGN and SGN during 155.3±105.8 months.

Conclusions:
ESRD was developed a small number of patients with ATN or ATIN. However, the risk of ESRD was significantly lower in patients with ATN or ATIN compared than GN. The risk of long-term mortality was not different between PGN and ATN or ATIN.