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조영제 유발성 신병증에서 종양괴사인자 수용체 1, 2의 역할에 대한 분석연구

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The Role of Circulating Tumor Necrosis Factor Receptor 1 and 2 in Contrast-induced Nephropathy

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Introduction: Contrast-induced nephropathy (CIN) is the important cause of hospital acquired acute kidney injury and often aggravates the progression of chronic kidney disease. The prevention and early intervention of CIN are crucial. Thus, we tried to evaluate the clinical role of circulating tumor necrosis factor receptors (cTNFRs) as predictors for CIN.

Methods: A total of 196 patients who underwent coronary angiography (CAG) and/or percutaneous coronary intervention (PCI) in Seoul National University Boramae Medical Center, during the period of May to November 2013, were enrolled. Blood and urine samples were obtained just before, at 24 hours, 48 hours, and 1month after CAG and/or PCI. Serum creatinine (sCr) level and estimated glomerular filtration rate (eGFR) were measured at each sample, and the levels of cTNFR1 and cTNFR2 were measured by using serum samples collected before CAG and/or PCI.

Results: Male gender was 59.2%, mean age was 65.1±11.3 years, and the patients with diabetes mellitus (DM) and chronic kidney disease (CKD) were 27.6% and 17.9%, respectively. Overall patients had fluid therapy before and after contrast use, and 36.2% underwent PCI. SCr level before procedure, 48 hrs after, and 1 month after procedure were 0.91±0.34 mg/dL, 0.97±0.46 mg/dL, and 0.97±0.38 mg/dL; levels of cTNFR1 and cTNFR2 were 1392.90±1090.44 pg/mL and 3319.58±3374.53 pg/mL, respectively. The levels of cTNFRs were closely correlated with decreased basal eGFR (Pearson's correlation analysis, cTNFR1 R=-0.586, $p<0.001$; cTNFR2 R=-0.522, $p<0.001$). The increment of sCr level for 48 hrs after procedure (ΔsCr) were significantly associated with ln (cTNFR1) and ln (cTNFR2) (R=0.313, p=0.004; R=0.293, p=0.008). These positive correlations were also significant after adjusting other risk factors for CIN, such as age, gender, DM, CKD, hypertension, the amount of contrast dye, and the use of concurrent nephrotoxic agents (R=0.541, $p<0.001$; R=0.556, $p<0.008$).

Conclusions: Decreased renal function after contrast-related procedure was significantly correlated with circulating TNFRs. Further studies, establishing the significance of cTNFRs as prognostic markers of CIN, will be needed.

Key Words: 종양괴사인자 수용체, 조영제유발성신병증
Tumor necrosis factor receptor, Contrast-induced nephropathy