

당뇨병이 동반된 만성 신질환 환자에서 사구체 여과율의 감소가 심혈관 질환의 발생에 미치는 영향

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Reduced Renal Function is Independently Associated with Cardiovascular Disease in Advanced CKD Patients with Diabetes Regardless of Amount of Albuminuria

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Background: Diabetic nephropathy is a typical micro-vascular complication. The natural course of diabetic nephropathy begins with hyperfiltration progressing to microalbuminuria, overt proteinuria, and subsequently to renal failure. However, recent reports demonstrated that diabetic chronic kidney disease (CKD) patients showed diverse clinical presentations and 20-40% of patients were normo- to microalbuminuric regardless of renal insufficiency. The aim of this study was to elucidate the clinical differences in advanced CKD patients according to degree of albuminuria.

Methods: We retrospectively collected data from diabetic patients with CKD stage III or IV between Jan 2007 and Dec 2009. Study subjects were divided into normoalbuminuria (NA), microalbuminuria (MiA), and macroalbuminuria (MA) group according to amount of albuminuria. Primary outcome was new-onset cardiovascular disease (CVD) or death and secondary outcome was progression to end-stage renal disease (ESRD) defined as initiation of dialysis or receiving renal transplantation.

Results: Among 1137 patients, 119 patients (10.5%) were NA group, 400 patients (35.2%) were MiA group, and 618 patients (54.4%) were MA group, respectively. Mean age was 61.7 years and mean estimated glomerular filtration rate (eGFR) was 38.9 ± 13.9 mL/min/1.73m². Mean age, duration of diabetes, history of CVD, and eGFR were significantly different among three groups. During a mean follow-up of 44 months, 18 patients (4.5%) in MiA group and 262 patients (42.4%) in MA group were progressed to ESRD. Twenty-six patients (21.8%) in NA group, 104 patients (26.0%) in MiA group, and 125 patients (20.2%) in MA group reached to primary outcome. Progression rates to ESRD were significantly higher in MA group compared to NA and MiA group ($p < 0.001$), however, development of CVD was not different among three groups ($p = 0.06$). Multivariate Cox proportional hazard analysis revealed that macro-albuminuria was an independent predictor for progression to ESRD (per 1 mg/g log albuminuria increase, odds ratio=3.317, $p < 0.001$), whereas albuminuria group was not a risk factor for development of CVD in study subjects.

Conclusion: There were significant and substantial differences in diabetic patients with renal dysfunction according to amount of albuminuria. However, incidence rates of CVD between macroalbuminuric and normo- to microalbuminuric group were comparable in diabetic patients accompanied with advanced renal insufficiency.

Key Words: 당뇨병성 신증, 미세알부민뇨, 심혈관계 합병증

Diabetic nephropathy, Microalbuminuria, Cardiovascular outcome