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Smoking is a risk factor for the progression of chronic kidney disease: From The KoreaN cohort study for Outcome in patients With Chronic Kidney Disease

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Objectives : Smoking is a risk factor of developing incident chronic kidney disease (CKD). However, most studies included relatively healthy participants without CKD and studies on the association between smoking and deterioration of kidney function in patients with CKD are scarce. Therefore, we aimed to evaluate the effect of smoking on kidney disease progression and dose-response relationship by pack-years in these patients.

Methods : The KoreaN cohort study for Outcome in patients With Chronic Kidney Disease (KNOW-CKD) is a nation-wide prospective observational cohort study from 9 centers in Korea. A total of 2218 patients were included in the analysis after excluding 20 patients who did not have data on smoking. Patients were categorized into never-, former-, and current- smokers. Primary outcome was a composite of a reduction of estimated glomerular filtration rate (eGFR) of ≥ 50%, initiation of dialysis, or kidney transplantation.

Results : The mean age was 53.6±12.3 years and 1356 patients (61.1%) were male. There were 1018 (46.0%) never-smokers, 668 (30.1%) former-smokers, and 348 (15.7%) current-smokers. Compared to never-smokers, former- or current- smokers had higher prevalence of diabetes (38.4% vs. 29.6%, P < 0.001) and cardiovascular disease (14.3% vs. 7.8%, P < 0.001) at baseline. In addition, these patients had higher blood pressure (128.9±16.7 vs. 127.0±15.8 mmHg, P = 0.007), lower estimated glomerular filtration rate (48.6±27.9 vs. 52.2±32.2 ml/min/1.73m2, P = 0.004) and higher level of proteinuria [1.6 (0.2-1.8) vs. 1.2 (0.1-1.2) g/day, P < 0.001] than never-smokers. During a mean follow-up duration of 36.7±18.2 months, primary outcome occurred in 168 (16.5%) in former- or current-smokers as compared to 164 (13.6%) in never-

smokers (P = 0.057). In a multivariable Cox regression analysis after adjustment of confounding factors, smokers were significantly associated with an increased risk of primary outcome (hazard ratio [HR], 1.36; 95% confidence interval [CI], 1.05–1.77; P = 0.020). In addition, HRs for primary outcome were 0.936 (95% CI 0.649–1.349; P = 0.723), 1.49 (95% CI 1.04–2.14, P = 0.030), 1.83 (95% CI 1.12–2.86, P = 0.008), and 2.21 (95% CI 1.39–3.51, P = 0.001) for <14.9, 15–29.9, 30–44.4 and ≥45 pack-years, respectively, suggesting that there was a dose-response relationship between smoking consumption and CKD progression.

Conclusions : This study clearly showed that smoking is associated with deterioration of kidney disease. Thus, quitting smoking should be a part of preventative strategy in management of CKD.

Keywords : smoking, chronic kidney disease, chronic kidney disease progression