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An Association of prediabetes and development of chronic kidney disease from a 9-year prospective cohort study

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Objectives: This study aims to evaluate the clinical impact of prediabetes defined by impaired fasting glucose (IFG), impaired glucose tolerance (IGT), and HbA1c level on the development of incident chronic kidney disease (CKD) in a Korean adult population using data from the Korea Genome and Epidemiology Study.

Methods: A 9-year prospective cohort study was performed on 7728 Korean adults without baseline CKD and diabetes. Prediabetes was defined by IFG, IGT and $HbA1_C$ level. CKD was defined as estimated glomerular filtration rate < 60 mL/min per 1.73 m^2. We evaluated the predictive value of prediabetes for incidence CKD and also investigated for cardiovascular disease including coronary artery disease and stroke.

Results: Over a median follow-up period of 8.7 years, 871 of 7728 (11.3%) subjects developed incident CKD. Prediabetes defined by IGT or $HbA1_C$ developed incident CKD more frequently than non prediabetic group. However, there was no significant difference in incidence of CKD between IFG and non-IFG groups. Compared with non-prediabetic group, IGT (Hazard ratio [HR], 1.177; 95% confidence interval [CI], 1.010-1.334; $P = 0.044$) and HbA1c defined prediabetic group (HR, 1.425; 95% CI, 1.243-1.634; $P < 0.001$) was associated with incident CKD after adjusting for traditional risk factors for CKD. However, IFG was not associated with incident CKD.

Conclusions: Our data showed that subjects with a diagnosis of prediabetes according to IGT or $HbA1_C$ level have increased the risk of incident CKD. However, IFG was not associated with CKD. These data suggest that earlier treatment of hyperglycemia may be needed to prevent the development of kindey damage, especially in subjects with glomerular hyperfiltration.