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The Relationship Between Diabetic Retinopathy and Diabetic Kidney Disease in a Population-Based Study in Korea

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Background: This cross-sectional study was undertaken to evaluate the prevalenceof diabetic kidney disease(DKD)and association between DKD and diabetic retinopathy(DR) in Korean patients with type 2 diabetes.
Methods: From the fifth (2011, 2012) Korea National Health and Nutrition Examination Survey (KNHANES), 971 participants with type 2 DM were included. Selected samples were designed to represent the entire civilian population in Korea. DKD was defined as diabetes with the presence of albuminuria and/or impaired GFR. Nonproteinuric DKD was defined as estimated glomerular filtration rate (eGFR) calculated by Modification of Diet in Renal Disease (MDRD) equation < 60 ml/min/1.73m^2 and no albuminuria. Multivariate logistic regression analysis was performed to determine risk factors, including DR, associated with DKD in the Korean population.
Results: From the fifth (2011, 2012) KNHANES, 971 participants with type 2 diabetes were included. The prevalence of microalbuminuria was 19.3% and that of macroalbuminuria was 5.5%. The prevalence of eGFR < 60ml/min/1.73m2 was 9.1%, and half of those were nonproteinuric DKD. There was a significant correlation between a decreasing GFR with increasing levels of ACR (*rho*= -0.120, *p*<0.001).
Multiple logistic regression analysis revealed that the association of nonproteinuric DKD with DR was weaker than that of proteinuric DKD. PDR[aOR=3.05; 95% CI = 1.12 – 8.33] were independent factors correlated with proteinuric DKD. But, DR[aOR = 1.94; 95% CI = 0.69-5.50; p = 0.212] and PDR[aOR = 1.24; 95% CI = 0.21-7.34; p=0.809] were not significantly associated with nonproteinuric DKD.
Conclusion: This is the first study investigating the association between DR and DKD, as evaluated by both proteinuria and eGFR, in a large population with type 2 DM in Korea. PDR is associated with proteinuric DKD, and DR and PDR are not associated with nonproteinuric DKD.

Keywords: diabetic kidney disease, diabetic nephropathy, diabetic retinopathy, epidemiology