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256

ASSOCIATION OF GLYCEMIC CONTROL LEVEL WITH THE CLINICAL MANIFESTATION OF KIDNEY INJURY AMONG PATIENTS WITH DIAGNOSED DIABETES:

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Diabetes mellitus is the leading cause of chronic kidney disease (CKD) worldwide. According to National Health and Nutrition Examination Survey (NHANES) data, the prevalence of kidney disease in patients with diabetes overall has not changed over time. However, the prevalence of the independent definining features have changed. While albuminuria (defined by albumin creatinine ratio [ACR] ≥ 30mg/g) has declined over time, prevalence of estimated glomerular filtration rate [eGFR] < 60 has increased. It is unknown whether the prevalence of these features is associated with glycemic control (defined by hemoglobin A1c). We sought to examine the association of glycemic control level with indicators of the clinical manifestation of CKD among patients with diagnosed diabetes.

We conducted a cross-sectional study using the NHANES 1999 through 2016, comprising patients with diagnosed diabetes. We defined diagnosed diabetes cases as those who reported being diagnosed by a doctor or using glucose-lowering medications (n= 5647). We characterized the proportion of any CKD (ACR ≥ 30 or eGFR < 60), albuminuria only (ACR ≥ 30 and eGFR ≥ 60), reduced-eGFR only (ACR < 30 and eGFR < 60), and both albuminuria and reduced eGFR (ACR ≥ 30 and eGFR < 60) among patients with diagnosed diabetes with good (A1c < 7%), intermediate (7% ≤ A1c < 9%) and, poor glycemic control (A1c ≥ 9%). Prevalence of patients with hyperfiltration (defined by eGFR ≥120) was also examined across glycemic control groups. We additionally assessed the association between eGFR and ACR with A1c, using univariate and multivariable linear regression models.

The proportion of any CKD among patients with diagnosed diabetes with good, intermediate and poor glycemic control was nearly the same (51%, 50%, 54%). The proportion of patients with reduced-eGFR only was highest in the group with good control, and the albuminuria only status was highest in the group with poor control (Figure). A1c was significantly associated with ACR (β-coeff= 33.9, p <.0001) and eGFR (β-coeff= 2.0, p <.0001) in univariate analysis. After adjustment for age, sex, race and age at diabetes diagnosis, associations remained significant only for ACR (β-coeff= 30.2, p =.0001). The percentage of hyperfiltration (relatively higher eGFR) was higher in the poor control group (8.5%) compared with the two other groups (intermediate control: 4% and good control: 3.2%).

This study demonstrated that among patients with diabetes, better glycemic control is associated with lower albuminuria, but not higher eGFR level. Further studies should examine the risk factors of eGFR decline in patients with diabetes.