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## **Diversity of Biopsy Proven Kidney Diseases in Patients with Diabetic Kidney Disease**

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### **Objectives:**

Diabetic kidney disease is the leading cause of end stage renal disease worldwide. In patients with diabetes, non-diabetic kidney disease (NDKD) can also occur. Distinguishing NDKD from diabetic nephropathy (DN) may influence on the treatment and renal outcome. We evaluated the spectrum and clinical characteristics of biopsy proven kidney diseases in type 2 diabetic patients.

**Methods:** We conducted a retrospective cohort study of 1454 patients who underwent native kidney biopsy from 2005 to 2018. Of the 1454 patients, 92 type 2 diabetic patients were enrolled. Patients were classified into three groups according to the pathologic diagnoses: DN, NDKD, and NDKD superimposed on DN (Mixed).

**Results:** The mean age at biopsy was  $56.3 \pm 12.9$  years and the mean serum creatinine was  $2.3 \pm 2.3$  mg/dL. The most common indications for biopsy were nephrotic syndrome (41.3%), followed by proteinuria (37.0%) and azotemia (21.7%). Among 92 patients, there were 61 NDKD (66.3%), 23 DN (25.0%), and 8 Mixed (8.7%). The most prevalent glomerular diseases in NDKD were membranous nephropathy (29.5%), focal segmental glomerulosclerosis (14.8%) and IgA nephropathy (13.1%). In Mixed group, focal segmental glomerulosclerosis was the most common diagnosis (25.0%), followed by IgA nephropathy (12.5%) and membranous nephropathy (12.5%). Diabetic retinopathy was more frequent in DN (60.9%) than Mixed (37.5%) and NDKD (6.6%, respectively,  $p < 0.001$ ) and was independently associated with DN (OR, 22.772; 95% CI, 5.923-87.554;  $p < 0.001$ ). Patients with DN had a lower renal survival rate compared with NDKD and Mixed in Kaplan-Meier analysis ( $p = 0.034$ ).

**Conclusions:** The spectrum of kidney disease in patients with type 2 DM was broad and prevalence of NDKD was 66.3%. Kidney biopsy should be considered in diabetic patients with an atypical course to obtain an accurate diagnosis and disease-specific treatment.