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Role of histopathological findings in predicting rapid Progression of Biopsy-proven Diabetic kidney disease

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Objectives : To study whether renal histopathological parameters, along with clinical characteristics,can predict rapid progression in patients with biopsy-proven diabetic kidney disease (DKD).
Methods : This is a retrospective study reviewing the medical records of 49 biopsy-proven DKD patients from January 2018 to 2022. Those who had less than 6 months of follow-up, CKD 5 were excluded from the study. The primary outcome was rapid progression to ESKD. Patients were categorized into rapid progressors and non-progressors based on the follow-up estimated glomerular filtration(eGFR) decline of >10 mL/min/1.73 m^2/year. The correlation of histopathological factors and clinical parameters with rapid progression was analyzed. Kaplan Meier curves and Cox regression were used to find independent risk factors for progressing to ESKD.
Results : In a median follow-up period of 1.6 years,57% were rapid progressors and 42.9% were non-progressors, with a median eGFR decline of -21 mL/min/1.73 m^2/year and -5 mL/min/1.73 m^2/year respectively. Among progressors,60.2% progressed to ESKD. In histopathological parameters, glomerular class 4 was significantly associated with rapid progression(p=0.03). Although the IFTA(p=0.24), interstitial inflammation(p=0.25),and arteriosclerosis scores(p=0.34) did not exhibit a significant association with rapid progression, it is noted that rapid progressors had higher IFTA score of 3 and the arteriosclerosis score of 1 compared to non-progrssors. Clinically, hypertension, HbA1c, and severe proteinuria were associated with rapid progression($p<0.05$). In Cox regression analysis, glomerular class 4(HR 1.1, CI1.0-1.4, p=0.04) and severe proteinuria(HR1.6, CI 1.0-2.1,p=0.01) were found to be independent risk factors for the progression to ESKD.
Conclusions : In our cohort, hypertension, high HbA1c, severe proteinuria, and global glomerular sclerosis (Class 4) were associated with rapid progression. In addition to Severe proteinuria,global glomerular sclerosis (Class 4) emerged as the sole independent histopathological risk factor for rapid progression . This highlights the need for large prospective studies in identifying the factors predicting rapid progressors in DKD so that timely intervention can be considered.