

Diabetic kidney disease: epidemiology to epigenetics and beyond

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Diabetic kidney disease (DKD), which is defined as chronic kidney disease in a person with diabetes, is one of the severe complications of diabetes, leading to end-stage kidney disease. According to the International Diabetes Federation report on diabetes and kidney disease, there is a 74% increase in the incidence of chronic kidney disease due to diabetes between 1990 and 2017 worldwide, and India stands third in possessing the highest number of incident cases. To tackle the huge burden of morbidity and mortality related to DKD, it is important to detect it early and manage it effectively. Albuminuria and estimated glomerular filtration rate are conventionally used to detect DKD. Some of the limitations associated with them in terms of early detection can be met by the discovery of novel biomarkers for DKD. Integration of multiomic markers discovered through genetic, epigenetic, transcriptomic, proteomic and metabolomic studies for DKD holds potential to identify better markers for DKD prediction and progression. The present review article aims to emphasise the burden of DKD and the need to find biomarkers for early detection, which will aid in targeted prevention of the onset and progression of DKD.

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and mortality associated with the condition⁸. The prevalence of diabetic complications as reported by different studies from India from 2000 to 2021 ranges from 4.8% to 21.7% for retinopathy, 10.5% to 44.9% for neuropathy and 0.9% to as high as 62.3% for diabetic kidney disease⁹⁻¹³.

CKD - the most burdensome complication of diabetes

Diabetic kidney disease (DKD) is the presence of chronic kidney disease (CKD) in diabetes¹⁴ and is one of the most burdensome complications of diabetes¹⁵. Kidney disease: improving global outcomes (KDIGO) defines CKD as kidney damage or a low glomerular filtration rate (GFR < 60 ml/min/1.73 m²) that lasts for at least three months. Persistent proteinuria is the principal marker of kidney damage, and it is used as an early and sensitive marker of CKD¹⁶.

According to the IDF report on diabetes and kidney disease, there is a 74% increase in the incidence of chronic kidney disease due to diabetes between 1990 and 2017 worldwide¹⁷ and India stands third in possessing the highest number of incident cases¹⁸. CKD affects about 10% of the general population, amounting to more than 800 million individuals worldwide¹⁹. A recent meta-analysis reported that the pooled prevalence of CKD in India was 13.24% and also indicated a rising trend of CKD among Indians aged 15 years and above²⁰. Because of challenges