Expert consensus on the diagnosis and management of diabetic kidney disease

Diabetic Kidney Disease Cooperative Group of Peking University Health Science Center

For the past decades, the rapid growth of economy and transition of lifestyles have led to a rapid rise in the prevalence of diabetes in China. Due to the lack of standard process in prevention and management of diabetic kidney disease (DKD) in China, the Peking University Health Science Center organized experts in fields of nephrology and endocrinology to develop the Chinese consensus statement of DKD. This consensus emphasizes on evidence-based inquiry, and focuses on the following three topics: (1) risk factors of the incidence and progression of DKD; (2) the diagnosis of DKD and indication of renal biopsy; (3) the overall management of DKD.

Risk Factors for the Incidence and Progression of DKD

(1) The incidence of DKD is embedded in a very complex group of genetic and epigenetic systems interacting within an equally complex societal framework that determines behavior and environmental influences. The major modifiable risk factors include hyperglycemia, hypertension, dyslipidemia, and obesity (2B).

(2) Proteinuria is important predictors for the incidence and progression of DKD (1B).

(3) Declined glomerular filtration rate is important predictors for the incidence and progression of DKD (1B).

(4) Hyperglycemia, hypertension, dyslipidemia, unhealthy diet pattern, and lifestyles are important risk factors for the progression of DKD (2C).

Diagnosis of DKD and Indications for Renal Biopsy

(1) Diagnosis of DKD: Patients with type 1 diabetes (T1D) and T2D develop moderate albuminuria (urinary albumin creatinine ratio [UACR] 30–300 mg/g) or massive albuminuria (UACR ≥300 mg/g) or reduction of estimated glomerular filtration rate (<60 mL·min⁻¹·1.73 m⁻²), with a complication of diabetic retinopathy and ruling out other causes of chronic kidney disease (CKD), then clinical diagnosis of DKD could be made (1B).

(2) Indications for renal biopsy in DKD: when urinary sediment shows active hematuria, sudden edema and/or massive proteinuria, rapid decline of renal function in short term, especially in the absence of retinopathy, renal biopsy is needed to rule out non-diabetic renal disease (NDRD) or DKD with concomitant NDRD (1B).

Management of DKD

Comprehensive management model including risk factors control (hypertension, hyperglycemia, and dyslipidemia), lifestyle modification, and education should be advocated for DKD patients (1B).

Glycemic management in DKD

(1) Optimized hypoglycemic therapy is recommended. Intensive therapy should not be over-emphasized in non-dialysis patients with DKD. It may be reasonable...
to control Hemoglobin A1c (HbA1c) within 7% to 8%; and individualized hypoglycemic therapy should be advocated (2B).

(2) Sodium-dependent glucose transporters 2 (SGLT-2) inhibitors show promising prospects in delaying DKD progression (2B)

**Blood pressure (BP) management in DKD**

(1) We recommend that non-dialysis adults with DKD whose blood pressure (BP) is consistently >140 mmHg systolic or >90 mmHg diastolic be treated with BP-lowering drugs to maintain a BP that is consistently <140 mmHg systolic and <90 mmHg diastolic (1C). We suggested that non-dialysis DKD patients with proteinuria were treated with BP-lowering drugs to maintain a BP that is consistently <130 mmHg systolic and <80 mmHg diastolic (2B)

(2) We recommend an ACE inhibitors or ARB be used in adults with non-dialysis dependent DKD (1B), especially those with hypertension, UACR ≥300 mg/g creatinine (1A). For non-dialysis patients with DKD, the combination of ACE inhibitors, ARBs, or direct renin inhibitor is not recommended (2B)

**Management of other cardiovascular risk factors**

(1) We suggest that non-dialysis dependent DKD patients use statins or statins combined with ezetimibe (2C).

(2) We suggest that serum uric acid in DKD patients be controlled within the normal range (2C)

(3) We suggest that the dietary protein intake is 0.8 g/kg per day for non-dialysis dependent patients with DKD (2B).

**Referral to a nephrologist (not graded)**

Based on recommendations of the guidelines of American Diabetes Association and Kidney Disease Improving Global Outcomes, referral to nephrologists’ services should be considered if diabetic patients had the following conditions: (1) a consistent finding of proteinuria and/or abrupt sustained fall in glomerular filtration rate (GFR); (2) CKD related complications requiring treatment (anemia, secondary hyperparathyroidism, mineral and bone abnormalities, refractory hypertension, severe electrolyte disturbance); (3) Advanced kidney disease (estimated GFR <30 mL min⁻¹·1.73 m⁻² requiring discussion of renal replacement therapy for end-stage kidney disease); (4) Absence of retinopathy (especially T1D) combined with rapid increase of proteinuria, or nephrotic syndrome.

**Future Clinical Research**

(1) Albuminuria and estimated GFR are important clinical indicators for the diagnosis and prognosis of DKD, but both have limitations. Further studies are needed to screen and verify novel early biomarkers (biomarker panels) of DKD in order to identify high-risk diabetic population and to predict prognosis.

(2) Genetic susceptibility for the incidence of DKD needs further in-depth exploration.

(3) In addition to traditional risk factors, identifying new modifiable factors related to the rapid progression of renal function and adverse prognosis in patients with DKD (eg, environmental and behavioral factors)

(4) The optimal target and monitoring frequency of glycemia for DKD population, as well as the effects and hypoglycemic risk of different hypoglycemic agents are unknown, especially those CKD stage 4 to 5 patients.

(5) The safety and efficacy of combined antihypertensive therapy on renal prognosis in DKD population.

(6) Whether intensive BP control could prevent the incidence of DKD? What are the BP targets for the special population, for example, elderly, those with a history of cardiovascular and cerebrovascular diseases?

(7) Whether long-term lipid management of DKD population could bring benefits on cardiovascular disease prognosis? What are the lipid management target for population with different CKD staging and different cardiovascular risks?

(8) Some novel agents have potential prospective in DKD population, such as endothelin receptor antagonists, non-steroidal mineralocorticoid receptor antagonists. Large-scale clinical studies are needed to verify the safety and efficacy of these novel agents in patients with DKD.

(9) The epidemiological characteristics for the incidence and development of DKD in young-onset diabetes, and the differences of DKD between T1D and T2D young-onset population need further clarify.

(10) What are the differences in the natural history of DKD incidence and progression in different types of diabetes? What are the effects of dietary proteins intake on the development of DKD?

(11) Among non-symptomatic hyperuricemic and diabetic population with different stages of CKD and different cardiovascular risks, when should we initiate uric acid-lowering therapy?

The details of Expert Consensus on the Diagnosis and Management of Diabetic Kidney Disease are shown in Supplementary Material, http://links.lww.com/CM9/A293.

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**Conflicts of interest**

None.

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