

Diabetes and the kidney

Introduction

Diabetes mellitus (DM) is the most commonly recognised cause of kidney failure, accounting for nearly 20% of new cases. There are two types of DM: Type 1, that usually starts in childhood or adolescence and patients require insulin injections; and, Type 2, which usually starts in middle life and patients do not always require insulin. Whichever type of DM you have, even when diabetes is controlled, the disease can lead to kidney problems. Fortunately, most people with diabetes do not develop a kidney problem that is severe enough to progress to end-stage renal disease (ESRD), requiring dialysis and/or a transplant.

The kidney can be affected in three different ways by DM (patients often have a combination):

1. Diabetic nephropathy – damage to the glomeruli (the microscopic filters in the kidney.)
2. Renovascular disease – furring up of the artery to the kidney (the same process that causes heart attacks and strokes.)
3. Urinary tract infections.

DM is increasingly common, affecting about 5% of the population, with a higher occurrence amongst Black or Asian people. Obesity is thought to be a major factor in Type 2 DM.

Course of kidney disease

Diabetic kidney disease takes many years to develop. People who are developing kidney disease will have small amounts of a blood protein called albumin leaking into their urine. This first stage is called microalbuminuria. Kidney function usually remains normal during this period. As the disease progresses, more albumin leaks into the urine. This stage is called proteinuria. As kidney damage develops, blood pressure often rises. Later on, chronic kidney disease (CKD) develops. At this stage, you may experience ankle swelling and shortness of breath (due to water in the lungs). It usually takes at least 10 years to get to this point. Dialysis may be necessary.

How you know you have kidney disease?

People with DM should be screened regularly for kidney disease. The key markers for kidney disease are serum creatinine (and a formula called eGFR) and the urine protein level.



Effects of high blood pressure

Both a family history of DM with complications, and the presence of hypertension (high blood pressure, BP), increase the chances of developing kidney disease in people with diabetes. Hypertension also accelerates the progress of kidney disease when it already exists.

All people with diabetes should keep their BP below 130/80.

Treatment of even mild hypertension is essential for people with DM.

Preventing and slowing kidney disease

Smoking: This is a 'no-no' for patients with DM. It causes renovascular disease (as does DM) and worsens kidney disease, as well as contributing to heart attacks and strokes. Try to give up. Your GP can help.

BP tablets: Drugs used to lower BP (to 130/80, or lower) can slow the progression of kidney disease significantly. Two types of drugs, angiotensin-converting enzyme inhibitors (ACEi) and angiotensin receptor blockers (ARB), are effective in slowing the progression of kidney disease. Patients with even mild BP or persistent microalbuminuria (first stage of diabetic kidney disease), should have low BP and preferably take an ACEi or ARB.

Other treatments: Keeping blood sugar well controlled may help, especially for those in the early stages of kidney disease. Lowering cholesterol to <5.0 mmol/L with a drug called a 'statin' may also be of benefit.

Dialysis and transplantation

When people with diabetes experience ESRD, they need either dialysis or a kidney transplant. Some patients with Type 1 DM can have a 'double' (kidney-pancreas) transplant. Currently, the survival of kidneys transplanted into people with DM is about the same as the survival of transplants in people without DM (about 10–15 years). Dialysis for people with diabetes also works well in the short run.

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