

Delivering a comprehensive screening programme for early-stage renal impairment in patients with diabetes

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Introduction

Diabetic kidney disease (DKD) is silent but deadly. It is the leading cause of kidney failure in the world and carries a 20 to 40-fold increased risk for cardiovascular mortality, yet there is an incontrovertible evidence base, derived from randomised controlled trials, for prevention and early management to reduce kidney injury and retard progression.^{1,2} Furthermore, models of care and systems of management have been evolved for populations that have reported positive outcomes.³ At a national level, however, variation in care processes and clinical- and patient-reported outcomes is large.⁴ Much of this variation is unwarranted and amenable to intervention. The impact of DKD on premature mortality, associated vascular and diabetic co-morbidities, hospitalisation and healthcare costs, makes DKD an ideal target for quality improvement.

National rates of end-stage renal disease (ESRD) due to DKD in the developed world, where access to renal replacement therapy (RRT) by kidney transplantation and dialysis is unrestricted, vary from 60% of the prevalent RRT population in Mexico to less than 15% in the Netherlands.⁵ Part of this observed difference is related to ethnicity, age structure, environmental exposures and behaviour-related factors such as smoking and obesity, all of which modify the population risk profile, but this is not the whole explanation. For instance, the RRT acceptance rate for white patients with DKD in the USA is currently 118 per million of the population (PMP), higher than the total acceptance rate of 109 PMP in the UK – of which 27.6 PMP are due to DKD. These differences are likely to reflect different national approaches and models of care that can alter the trajectory of DKD.⁵

Suspicion of diabetic nephropathy is usually prompted by simple routine or screening blood and urine tests. It must

be remembered that, as type 1 diabetes mellitus is diagnosed at the onset of the disease, nephropathy is rarely seen in the first decade of the disease. However, the situation is quite the opposite for type 2 diabetes mellitus. Many with type 2 diabetes may have had undiagnosed abnormal glycaemic control for a significant period of time, and present with complications of diabetes when it is first diagnosed. The development of DKD results from increased intraglomerular pressure and glycosylation injury to the glomerular basement membrane. This often, but not always, results in microalbuminuria, followed by progressive loss of excretory function as a consequence of glomerulotubular fibrosis, sclerosis and atrophy, manifest clinically by a fall in the estimated glomerular filtration rate (eGFR) and finally by renal failure. Among people with diabetes, 35–40% will develop DKD. Hyperglycaemia plays a critical role in the development of DKD. This is compounded by elevated blood pressure, hypercholesterolaemia, smoking and the other cardiovascular risk factors including family history of vascular events or renal failure.

Management

Stringent glycaemic control has been well proven to prevent onset and to delay progression of DKD; it can at least partly reverse the glomerular hypertrophy and hyperfiltration characteristic of early DKD.¹ Reduction of arterial blood pressure below 130/80 mmHg has also been proven to be one of the most effective ways to slow progression of DKD. Blockage of the renin angiotensin aldosterone system with angiotensin converting enzyme inhibitors or angiotensin receptor blockers has been shown to have additive benefit over and above BP control in both preventing the onset of microalbuminuria and delaying the progression of DKD in people with diabetes and hypertension.⁶

Strategy for improvement

Many commentators have stressed the need for long-term condition management to be proactive, holistic, preventive and patient-centred. This assumes an active role for people with diabetes and/or kidney disease, who are encouraged to become both more knowledgeable about factors affecting their condition and more actively involved in their own care. It also requires a shift in the skills of and incentives for healthcare professionals to support self-management and to promote shared decision-making, in which patients bring their own expertise and values to the decisions about their care. The third component of this healthcare context is the organisation, coordination and systems of delivery of care. Robust, systematic and reliable processes are required to deliver high quality care and address the unwarranted variations in patterns of care and patient outcomes.³ An agreed local model of care clarifying the role of patient and family, primary care practitioners and specialist multidisciplinary teams is important to prevent fragmented, duplicated or incomplete care in risk factor control, treatment adjustment or disease monitoring. Local clinical networks can facilitate the agreement and implementation, including clear communication with patients, professional training, and dissemination of more detailed clinical pathways and guidelines for consistent disease management.⁷

Combined management of both conditions will reduce the treatment burden for patients, ensures a consistent approach, and is an efficient use of professional time.

Registration, recall and review underpin population-based care for long-term conditions.⁸ Disease registers of all patients known to have diabetes and chronic kidney disease (CKD) should be

managed and owned in every primary care health practice or at district level. Patients on the disease register should be regularly recalled for review of the condition and management of the risk factors for disease complications. Disease registers include measurement of disease indicators, enabling practice teams to review completeness of care for individuals and populations, and, through comparison with other practices, review and improve their performance in detecting and managing patients with these conditions. For individual patients who have both conditions, combined assessment of these conditions is appropriate in primary care as the major element of care is cardiovascular risk management. The majority of patients with the combination of diabetes and CKD in a population will be managed entirely in primary care, as only around 10% of those with both conditions will have CKD at stage 4 or 5, whereas most will have CKD at stage 3a. Within the UK's National Health Service, most of the primary care management will be coordinated by practice nurses, with involvement of the general practitioner for therapeutic changes, diagnostic uncertainties and the management of co-morbidities. The Quality and Outcomes Framework for General Practice (QOF) in the NHS includes domains on diabetes and CKD, and rewards primary care practices for completeness of processes and clinical indicators in these disease areas. This has improved healthcare practitioners' awareness of kidney disease and some aspects of diabetes care,⁹ but has limitations in that high scores of individual indicators may be achieved despite relatively low levels of complete care. Best practice is to move to "all or none" measures of complete care¹⁰ based on the importance of managing multiple risk factors simultaneously.

Despite the success of early detection programmes in the UK, many people with DKD remain unaware that they have kidney disease. Whilst a reluctance to disclose may be understandable in some circumstances, such practice is divergent from a patient-centred approach to chronic disease management. In DKD, disclosure can provide a platform to discuss lifestyle choices, addressing vascular risk factors and co-morbidities within a model of collaborative self-management, and will avoid missed opportunities to modify disease progression.¹¹ DKD is a risk factor for acute kidney injury, which is more common than has traditionally been recognised and is associated with progression of DKD and poor outcome. Patients should be educated on preventive strategies, including adequate hydration and the temporary cessation of medications such as renin-angiotensin blocking agents during periods of acute illness. A diagnosis of DKD is important for medicine management, both of prescribed drugs including oral hypoglycaemic agents and of those purchased over the counter including ibuprofen-containing medications.

Effective interaction between primary care and specialists for patients with DKD is essential. Traditionally the interface between primary and specialist care has been by referral, discharge and clinical correspondence. Many patients can have their care enhanced, however, via more informal interactions between primary and specialist care. These can include telephone- or email-based case discussion, notes-based case reviews, and joint consultations.^{12,13} There are also examples of a more proactive approach in DKD management in which monitoring of renal function data has been used to identify patients for whom specialist input can add value in the identification and management of modifiable factors promoting progression, and thus reducing the evolution of DKD to ESRD.^{14,15} These systems also reduce the incidence of late presentation by people with advanced CKD, who will benefit from preparation and shared decision-making about ESRD options, including conservative kidney care – the no dialysis option.

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