

Can community-based clinics be used to reduce the progression of diabetic nephropathy?

Sue Foster

Citation: Foster S (2014) Can community-based clinics be used to reduce the progression of diabetic nephropathy? *Diabetes & Primary Care* 16: 242–5

Article points

1. There is a substantial evidence base that supports hypertension as being a risk factor for kidney dysfunction.
2. Intermediate diabetes renal clinics can be used to provide care closer to home in the community-based settings with an integrated team approach.
3. A three-tier system of specialists could support effective management of people with diabetic nephropathy, comprising: a community specialist diabetes renal nurse or GP; a diabetes consultant; and a nephrologist.
4. Effective communication across primary and secondary care and early intervention are important for prevention of deterioration of chronic kidney disease.

Key words

- Blood pressure control
- Communication
- Early intervention
- Education

Authors

Sue Foster is a Community Diabetes Specialist Nurse, Buckinghamshire Healthcare NHS Trust.

This article explores the question of whether a community clinic could potentially lead to improved outcomes for people with diabetic nephropathy. In particular, it investigates whether early intervention with a dedicated clinic to optimise blood pressure is beneficial to reduce nephropathy in people with type 2 diabetes.

In a report on commissioning specialist diabetes services, Diabetes UK (2010) stated that “Patients with diabetes should have access to regular surveillance for diabetes complications, receive effective investigation and/or treatment if any complications are detected, and expect integrated seamless health care if input from different services is required.” One of the specialisms it discussed was a renal diabetes service. Kidney dysfunction is a prevalent accompaniment to diabetes and can be fatal in the end stages (Go et al, 2004). An analysis of UKPDS (the UK Prospective Diabetes Study) 74 found that over a median of 15 years’ follow-up, 38% of 4031 people who initially did not have albuminuria developed this condition and 29% of 5032 people with initial normal plasma creatinine went on to develop renal impairment (Retnakaran et al, 2006).

There are five stages of chronic kidney disease (CKD), most readily assessed by tests for estimated glomerular filtration rate (eGFR), albuminuria and urine sediment among others, and with further examination by imaging aiding diagnosis (NICE, 2014).

Blood pressure and kidney dysfunction

Hypertension is a major risk factor for kidney dysfunction (Tedla et al, 2011). A brief review of some relevant evidence is provided in *Box 1*.

Community clinics

Like other diabetes-related disorders, CKD requires assessment, monitoring and treating. As CKD can be asymptomatic, regular monitoring may pick up early development especially in susceptible populations such as people with diabetes. But what is the best pathway for diabetic nephropathy? Currently, NICE recommends that primary care clinicians monitor kidney function yearly in those with diabetes, starting them on an angiotensin-converting enzyme inhibitor if they have a raised albumin excretion rate. If the renal disease is suspected to be something other than diabetic nephropathy, further investigation or referral is recommended (NICE, 2009).

A number of organisations have found that early intervention is best for prevention of deterioration of CKD, including Diabetes UK (2010). A health technology assessment found that early referral to a nephrologist was associated with an increase in quality-adjusted life-years (Black et al, 2010). Another study found that early identification and referral to the hospital specialist improved renal function and blood pressure compared with management by family doctors (Martinez-Ramirez et al, 2006).

So does this mean that all care for CKD should be at the specialist level? The Diabetes

UK (2010) report suggested development of a number of specialist diabetes teams, including clinicians, nurses, clinical psychologists, podiatrists and dietitians, who collaborate with other specialists when needed. It proposed that diabetes renal services have an integrated team approach of communication and management that included working closely with nephrology services, allowing effective coordination of care. Importantly, it suggested that these specialist teams can be based either in hospitals or in community settings, gauging the needs of those whose care they cover with regard to the mix of specialisms within the team. They detail how intermediate diabetes care teams “support the concept of care closer to home and comprise specialist ambulatory diabetes services provided in community-based settings” (Diabetes UK, 2010).

A three-tier system of specialists could support effective management of people with diabetic nephropathy: a community specialist diabetes renal nurse or GP; a diabetes consultant; and the nephrologists. Here, local services could provide initial therapy and close monitoring for control, compliance and side effects, with referral to hospital only if targets were not being met. In order for an integrated system to work effectively, between hospital and community, there needs to be good communication (Goenka et al, 2011).

But do teams that are more localised work? In theory, clinics that operate in the community nearer to patients’ homes provide easier access and are thus likely to be better attended, and there are a number of examples where community-based services have been effective. For instance, Jones et al (2006) evaluated a shared care system between primary and secondary care in people with moderate to advanced CKD over 3 years, compared with a hospital nephrology clinic. This study suggested that people could be managed in primary care without attending the hospital renal unit and that there were significant improvements in blood pressure and the use of angiotensin-system inhibitors. In another study, early intervention by

specialist nurses (who aggressively managed blood pressure and used drugs to help control progression of renal disease) followed a community protocol of drug titration, education and concordance. The investigators successfully lowered average blood pressure

Box 1. Key evidence linking hypertension and kidney dysfunction.

- In people with type 2 diabetes in UKPDS (the UK Prospective Diabetes Study), development of albuminuria and renal impairment was independently associated with baseline systolic blood pressure (SBP; Retnakaran et al, 2006). An analysis of participant characteristics in a study of nephropathy found that for every 10 mmHg increase in SBP or diastolic BP (DBP), the risk of end-stage renal disease (ESRD) or death increased by 6.7% and 10.9%, respectively (Bakris et al, 2003).
- As such, blood pressure management is an essential part of addressing chronic kidney disease (CKD). NICE suggests that the target range for people with CKD and diabetes is 120–129 mmHg for SBP and below 80 mmHg for DBP (NICE, 2014). In the Bakris et al (2003) study discussed above, those with a high baseline pulse pressure given an antihypertensive angiotensin receptor blocker and followed up for a mean of 3.4 years had a 53.3% risk reduction for ESRD.
- In a similar study (the ADVANCE [Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation] trial), 11 140 people aged 50 years or above with type 2 diabetes were administered either a combination of an angiotensin-converting enzyme inhibitor and a diuretic or a placebo for a mean of 4.3 years. Participation was irrespective of blood pressure. While entry blood pressure was on average 145/81 mmHg, 20% of participants had a BP <130/80 mmHg. At final follow-up, mean SBP and DBP were both significantly lower for the active treatment group. The hazard ratio (HR) of developing a composite renal outcome in the treatment group compared to controls was 0.79, with active treatment also reducing the risk of developing overt nephropathy (HR, 0.69; de Galan et al, 2009).
- In another study (the ACCORD [Action to Control Cardiovascular Risk in Diabetes] trial), 4733 people with type 2 diabetes were given either intensive therapy or standard therapy to reduce SBP. In the intensive group, where SBP was reduced to an average of 119.3 mmHg, compared with 133.5 mmHg in the standard group, the frequency of macroalbuminuria at the end of the study was significantly lower with intensive therapy (ACCORD Study Group et al, 2010).
- However, it is of note that there were also adverse outcomes in some of these studies. At the end of the ACCORD study, there were significantly more people in the intensive therapy group with an estimated glomerular filtration rate <30 mL/min/1.73 m² compared with in the standard therapy group, although there were no differences in ESRD frequency (ACCORD Study Group et al, 2010). In the ADVANCE study, there were higher rates of hypotension and electrolyte imbalance in the active treatment group, compared with the control group (de Galan et al, 2009).

and saw decreases in microalbuminuria with increases in eGFR, suggesting a reduction in the deterioration of renal disease (Mugarza et al, 2008).

A major consideration in diabetes care is the need for holistic management, which should include access to local services for dietetics, exercise, smoking cessation and weight management. The Steno-2 study looked at a multifactorial intervention, which also included medication for reducing hyperglycaemia and microalbuminuria. In the observation period, diabetic nephropathy and end-stage renal disease were significantly reduced (Gaede et al, 2008). Of prime importance in any such intervention is adherence to both medication and lifestyle changes. For this to happen, it could be argued that there needs to be education and understanding regarding the significance of treatment. In a scheme that provided a community-based structured education programme to a multi-ethnic group of people with type 2 diabetes, comparing it with usual care, significant improvements were noted in blood pressure, coronary heart disease, HbA_{1c} and hypoglycaemia (Craeto et al, 2011).

Community services are of great use, not least because, as mentioned above, they provide treatment nearer to home. This is especially valuable for older people and those with a disability. Providing a more locally tailored service also has potential benefits for people from an ethnic group with a higher risk of developing renal disease, such as people of South Asian origin (Fischbacher et al, 2003; Retnakaran et al, 2006). Moreover, clinics that operate in areas where there is more social deprivation, which is correlated with an increased prevalence of kidney disease, may improve disease outcomes (Hossain et al, 2011).

Supporting effective communication with the use of individual management plans that are shared between the patient and healthcare professional allows the individual to take ownership of the condition. Such a system set up in Italy, which also included a telemedicine component and home blood pressure measurements, was shown to reduce the progression of albuminuria (Musacchio et al, 2011). Again, this would allow individuals to take an active participation in their health.

Other considerations

Intensive blood pressure management can involve polypharmacy, and potential side effects of such treatment should be considered (e.g. de Galan et al, 2009; ACCORD Study Group et al, 2010), particularly in older people, for whom individualisation of care may be particularly important (Tedla et al, 2011).

Potential obstacles

Clearly, the implementation of such clinics will not be without obstacles. For instance, there will be financial implications, and it is reasonable to assume that, in the current NHS, they would come at the expense of some other element of care services. Collecting further data, with a view to allowing a clearer picture of the health economics to emerge, is therefore of great importance.

Pilot study

In order to collect data in a local setting, I ran a 6-month pilot study of a renal diabetes clinic in the community. In this short study, improvements in blood pressure were observed, and patient evaluation suggested there was enhanced continuity of care and better access to clinical support.*

Conclusion

In this article, it has been argued that dedicated clinics to provide monitoring of blood pressure in the community could be effective in reducing the burden of diabetic nephropathy. It is well known that medication adherence is generally poor, suggesting that a collaborative care model involving community education programmes, pharmacists and nurse-led clinics could be used to optimise care. The use of management plans, in part to address lifestyle issues, could help facilitate patient empowerment and medication concordance. Moreover, a multifactorial approach addressing lifestyle issues together with optimising blood pressure medication could improve renal outcomes.

Evidence from community nurse-led renal diabetes clinics is limited, but provision of treatment closer to areas where needed would appear to help facilitate better care. In light of the ageing population and ethnic groups who have an increased risk of diabetic kidney disease, an integrated team approach with effective communication is urgently required between hospital and community. ■

*Further details of the pilot study are available from the author.

- ACCORD Study Group, Cushman W, Evans G et al (2010) Effects of intensive blood pressure control in type 2 diabetes mellitus. *N Engl J Med* **362**: 1575–85
- Bakris GL, Weir MR, Shanifar S et al (2003) Effects of blood pressure level on progression of diabetic nephropathy: results from the RENAAL study. *Arch Intern Med* **163**: 1555–65
- Black C, Sharma P, Scotland G et al (2010) Early referral strategies for the management of people with markers of renal disease: a systematic review of the evidence of clinical effectiveness, cost-effectiveness and economic analysis. *Health Technology Assessment* **14**: 1–184
- Crao W, Jarvis J, Khunti K et al (2011) Multifactorial intervention in individuals with type 2 diabetes and microalbuminuria: the microalbuminuria education and medication optimisation (MEMO) study. *Diabetes Res Clin Pract* **93**: 328–36
- de Galan BE, Perkovic V, Ninomiya T et al (2009) Lowering blood pressure reduces renal events in type 2 diabetes. *J Am Soc Nephrol* **20**: 883–92
- Diabetes UK (2010) *Commissioning a Specialist Service for Adults with Diabetes*. Diabetes UK, London
- Fischbacher C, Bhopal R, Rutter M et al (2003) Microalbuminuria is more frequent in South Asian than European origin populations: a comparative study in Newcastle, UK. *Diabet Med* **20**: 31–6
- Gaede P, Lund-Andersen H, Parving H, Pederson O (2008) Effect of a multifactorial intervention on mortality in type 2 diabetes. *N Engl J Med* **358**: 580–91
- Go A, Chertow G, Fan D et al (2004) Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization. *N Engl J Med* **351**: 1296–305
- Goenka N, Turnert B, Vora J (2011) Commissioning specialist diabetes service for adults with diabetes: summary of a Diabetes UK task and Finnish group report. *Diabet Med* **28**: 1494–500
- Hossain M, Goyder E, Rigby J, El Nahas M (2009) CKD and poverty: a growing global challenge. *Am J Kidney Dis* **53**: 166–74
- Jones C, Roderick P, Harris S, Rogerson M (2006) An evaluation of a shared primary and secondary care nephrology service for managing patients with moderate to advanced CKD. *Am J Kidney Dis* **47**: 103–14
- Martinez-Ramirez H, Jalomo-Martinez B, Cortes-Sanabria L et al (2006) Renal function preservation in type 2 diabetes mellitus patients with early nephropathy: a comparative prospective cohort study between primary health care doctors and a nephrologist. *Am J Kidney Dis* **47**: 78–87
- Mugarza J, Wilding J, Woodward A et al (2008) Achieving blood pressure control in patients with type 2 diabetes and diabetic renal disease by a nurse-led protocol based clinic. *British Journal of Diabetes & Vascular Disease* **8**: 279–84
- Musacchio N, Lovagnini Scher A, Giancaterini A et al (2011) Impact of a chronic care model based on patient empowerment on the management of type 2 diabetes: effects of the SINERGIA programme. *Diabet Med* **28**: 724–30
- NICE (2009) *Type 2 diabetes: The management of type 2 diabetes (CG87)*. NICE, London. Available at: <http://www.nice.org.uk/guidance/cg87> (accessed 10.09.14)
- NICE (2014) *Chronic kidney disease: Early identification and management of chronic kidney disease in adults in primary and secondary care (CG182)*. NICE, London. Available at: <http://www.nice.org.uk/guidance/cg182> (accessed 10.09.14)
- Retnakaran R, Cull C, Thorne K et al (2006) Risk factors for renal dysfunction in type 2 diabetes: U.K. Prospective Diabetes Study 74. *Diabetes* **55**: 1832–9
- Tedla F, Brar A, Brown R, Brown C (2011) Hypertension in chronic kidney disease: navigating the evidence. *Int J Hypertens* **2011**: 132405

“Dedicated clinics to provide monitoring of blood pressure in the community could be effective in reducing the burden of diabetic nephropathy.”