Do improvements in the delivery of care translate into improvements in outcomes of diabetes-related complications?

Jiten Vora
CardioDigest Editor

Over the last 15 to 20 years, a number of seminal studies, including the DCCT (Diabetes Control and Complications Trial) and the UKPDS (United Kingdom Prospective Diabetes Study), have demonstrated that the control of risk factors can reduce microvascular and macrovascular complications in individuals with type 1 and type 2 diabetes (e.g. The DCCT Research Group, 1993; Adler et al, 2000; Stratton et al, 2000). These studies focussed on the improvement of glycaemic control and the treatment of hypertension and hyperlipidaemia, as well as aiming to encourage the medical fraternity to implement better clinical care by enhancing healthcare system performance and health promotion efforts. Recent changes worldwide have included improvements in team-based care, patient education in disease management and decision-making support. Furthermore, clinicians have been focussing on screening individuals at risk of developing early complications, the progression of which may be reduced by aggressive risk factor management.

Consequently, do these improvements in the delivery of care translate into improvements in the detection and outcomes of diabetes-related complications? To answer this question it is, therefore, appropriate to concentrate on a recently published study evaluating the trend in diabetes-related complications in the United States between 1990 and 2010 (Gregg et al, 2014). The study utilised data from the National Health Interview Survey, National Hospital Discharge Survey, US Renal Data System and US National Vital Statistics System to compare the rates of myocardial infarction, stroke, lower extremity amputation, end-stage renal disease and death from hyperglycaemic crisis.

Rates of all five complications declined during the 20-year period, with the largest declines in acute myocardial infarction (–67.8%), death from hyperglycaemic crisis (–64.4%) and stroke (–52.7%). The absolute decline in the number of cases of acute myocardial infarction was 95.6 fewer cases by 10 000 persons over the study period, which was the highest for all the investigated complications. Lower extremity amputations declined by 51.4%, and the smallest decline was in end-stage renal disease (28.3%). The lower reduction in the rate of end-stage renal disease may reflect a declining mortality from cardiovascular disease, resulting in an older patient population who develop chronic kidney disease.

While these results are extremely encouraging for clinicians practising in the field, the reductions in these particular complications do not translate to a reduction in the overall burden of diabetes-related complications. It is currently apparent that the annual numbers of myocardial infarctions, strokes, amputations and end-stage renal disease continue to increase owing to the increasing prevalence of diabetes. This analysis triggers the call for a further invigorated effort in all aspects of care involved in improving the outcomes of people with diabetes. ■

Adler AI, Stratton IM, Neil HA et al (2000) Association of systolic blood pressure with macrovascular and microvascular complications of type 2 diabetes: prospective observational study. *BMJ* **321**: 412–9

Gregg EW, Li Y, Wang J et al (2014) Changes in diabetes-related complications in the United States, 1990–2010. *N Engl J Med* **370**: 1514–23

Stratton IM, Adler AI, Neil HA et al (2000) Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes: prospective observational study. *BMJ* **321**: 405–12

The Diabetes Control and Complications Trial Research Group (1993) The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* **329**: 977–86

Affiliation
Professor of Diabetes, Royal Liverpool University Hospitals, Liverpool