Type 1 diabetes care: Are we doing enough?

In this section, a panel of multidisciplinary team members give their opinions on a recently published paper. In this issue, we discuss two studies on mortality rates in the type 1 diabetes population.

Estimated life expectancy in a Scottish cohort with type 1 diabetes, 2008–2010.

Livingstone SJ, Levin D, Looker HC et al (2015) *JAMA* **313**: 37–44

JAMA

Reduced life expectancy in a Scottish T1D population

1 These authors studied the Scottish Care Information–Diabetes Collaboration database to provide a contemporary estimate of life expectancy in people with T1D based on death rates between 2008 and 2010.

2 A total of 24 691 people with T1D aged ≥20 years were evaluated.

3 In the T1D cohort, there were 1043 deaths over a follow-up of 67 712 person-years, whereas in the general population there were 161 023 deaths over 12 064 456 person-years.

4 Compared with the general population, estimated life expectancy at age 20 years was reduced by 11 years in men and 13 years in women. In the general population, 76% of men and 83% of women survived to age 70 years, compared with 47% of men and 55% of women with T1D.

5 The relative risk of death in the T1D population increased according to chronic kidney disease (CKD) stage (1.74 for stage 3, 4.70 for stage 4 and 8.70 for stage 5 compared with no CKD); however, even those with an estimated glomerular filtration rate over 90 mL/min/1.73 m^2 had a substantially lower life expectancy than the general population.

6 Ischaemic heart disease was the most common cause of death, responsible for 30.7% of deaths in men and 26.8% in women, and circulatory disease in general contributed to >40% of the differential in life expectancy at all age strata.

7 The other most common causes were diabetic coma or ketoacidosis (6.8% in men, 3.8% in women) and renal failure (5.7% in men, 6.2% in women).

8 The authors note that it was not possible to determine whether life expectancy in the Scottish T1D population has improved over recent decades; nonetheless, the risk of death remains much higher in this population.

Association between 7 years of intensive treatment of type 1 diabetes and long-term mortality.

DCCT/EDIC Research Group (2015) *JAMA* **313**: 45–53

JAMA

Extended effect of early intensive treatment on mortality in T1D

1 In this article, the long-term follow-up of the DCCT/EDIC (Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications) trial was reported.

2 In DCCT, between 1983 and 1993, a total of 1441 people with T1D were randomised to intensive or standard therapy, and the two groups achieved mean HbA_{1c} levels of around 53 mmol/mol (7%) and 75 mmol/mol (9%), respectively, over a mean follow-up of 6.5 years.

3 Thereafter, 1394 of the participants (97%) were enrolled in EDIC and returned to the care of their own physicians. After 5 years of EDIC follow-up, HbA_{1c} levels in the two groups had equalised at approximately 64 mmol/mol (8%).

4 In the latest follow-up, at a mean of 27 years, there have been 107 deaths, of which 43 were in the intensive treatment group (n=711; 6.0%) and 64 were in the standard group (n=730; 8.8%).

5 Mortality risk per 100 000 person-years was lower in the intensive group (hazard ratio [HR] 0.67; 95% confidence interval, 0.46–0.99; P=0.45). The cumulative mortality between the groups began to differ significantly 15 years after DCCT initiation.

6 The most common causes of death were cardiovascular events (22.4%), cancer (19.6%), acute diabetes complications (17.8%), and accidents or suicide (16.8%).

7 Higher HbA_{1c} (HR 1.56 per 10% relative increase in HbA_{1c}; P<0.001) and albuminuria (HR 2.20; P<0.001) were significantly associated with all-cause mortality.

8 The authors conclude that overall risk of death was lower in the intensive treatment arm, although the difference was small (approximately one per 1000 person-years).

Pratik Choudhary

Senior Lecturer and Consultant in Diabetes, King's College London

These two papers really ask us to reassess targets for glycaemic control in type 1 diabetes. The study by Livingstone et al shows us that, in a Scottish cohort, type 1 diabetes was associated with a reduction in life expectancy of just over a decade. It is tragic to see that, in patients aged <50 years, acute complications such as diabetic ketoacidosis are still major offenders but, surprisingly, even in this young population, cardiovascular events accounted for 20.7% of deaths. Unfortunately, mean HbA_{1c} across the cohort was not reported and, with an average diabetes duration of 18 years, it is possible that many of these participants had not had access to structured education or technology such as insulin pumps in their early years.

The second article, from the DCCT/EDIC (Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications) group, highlights the importance of early control. Even though glycaemic control was similar between the groups for over 20 years of the total follow-up, a 1.7% difference in HbA_{1c} (57 mmol/mol [7.4%] vs 76 mmol/mol [9.1%]) in the initial phase resulted in 21 fewer deaths in the cohort who received intensive treatment for just 6.5 years. Those who died had a higher baseline HbA_{1c} and a higher risk of cardiovascular and renal disease.

There is, however, a very sobering fact hidden in these papers, with the high risk of suicide and accidental death highlighted in both. This points to how poorly we manage the psychological distress caused by diabetes, and how difficult some patients can find it to achieve their targets.

In the end, though, the importance of intensive treatment early on is a clear message. Overall, 50% of participants in the intensive treatment arm of DCCT required insulin pumps to achieve their goals (Nathan et al, 2013), and so a treatment algorithm based on failure to achieve poor control (HbA_{1c} >69 mmol/mol [8.5%]) to gain access to tools such as education and technology may miss the boat, providing at best the results achieved in the conventional treatment arm of DCCT/EDIC. This arm showed that even though control improved from 76 mmol/mol (9.1%) to 60 mmol/mol (7.6%) for the subsequent 20 years, those individuals had 33% higher mortality. And the data show how much better we can do if we start earlier. ■

Nathan DM, Bayless M, Cleary P et al (2013) Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications Study at 30 Years: advances and contributions. *Diabetes* **62**: 3976–86

Partha Kar

Lead Type 1 Diabetes Consultant, Queen Alexandra Hospital, Portsmouth

Type 1 diabetes has always been the poorer cousin in the overarching realm of diabetes care, mostly subsumed by the needs and awareness (or lack thereof) surrounding type 2 diabetes. In the world of data and science, there has rarely been any debate about the importance of glucose control in type 1 diabetes, yet somehow the controversy surrounding that particular area in type 2 diabetes has harmed care of many people with type 1 diabetes.

These two studies further show the importance of improved glycaemic control in type 1 diabetes and, within the healthcare system, the need to try and help patients achieve this. As things stand, the quality and outcomes of type 1 diabetes care are variable and patchy, according to national audits, and there is, perhaps, now a need to have a discussion of how care is provided.

Should we commission type 1 diabetes care separately from that of type 2 diabetes? The needs, the science, the physiology: all are fundamentally different, yet we try and manage these two disparate conditions together under one label. Technology is moving at a pace and it is up to us as professionals to keep up with it, as well as patient needs. Insulin pumps, continuous glucose monitors, wearable technology: an open debate should be had as to whether the funding for this should be made available by reviewing how type 2 diabetes care is delivered.

Diabetes centres should be judged based on the quality of care they provide and the outcome measures, if open data, should be made available to patients and their carers so that they can choose the best available centre to access for their care. Do we need to think bigger and consider the option of regional type 1 diabetes centres, whereby overall care could improve for this population?

If we do not have an open discussion about the above and continue to badge diabetes as a single entity in spite of the evidence base, the likelihood is that improved care will sit in the hands of a few whereas the population requires it to be the norm. The time for talking is over. It's time to act. ■

Let us know your thoughts by emailing dd@sbcommunicationsgroup.com