

Intensive therapy reduces CVD risk in type 1 diabetes



Daniel Flanagan,
Consultant Physician,
Derriford Hospital,
Plymouth

The phrase 'landmark paper' is perhaps overused but the original paper from the Diabetes Control and Complications Trial (DCCT) Research Group (1993) really did represent an important event. For the first time we

had robust evidence linking tight glucose control to a reduction in the complications associated with diabetes.

The original study followed 1441 people with type 1 diabetes for 6.5 years. Individuals were randomly assigned to either tight glycaemic control (mean HbA_{1c}, 7.4%) or standard care (mean HbA_{1c}, 9.1%). The study convincingly demonstrated a causal link between glucose control and the microvascular complications of diabetes. The study did not, however, demonstrate a link between glucose control and cardiovascular disease (CVD). The authors, at the time, pointed out that the study was not designed to study macrovascular end points in what was a relatively young population over a relatively short period.

Having said that, type 1 diabetes clearly is associated with a significantly increased risk of CVD, often with a notable absence of the other risk factors almost universally seen in people with type 2 diabetes. It has seemed highly likely

that high blood glucose is playing a direct part in cardiovascular risk but we have been waiting for a study to prove it. The DCCT/Epidemiology of Diabetes Interventions and Complications (EDIC) study group appears now to have provided that eagerly awaited information.

The study (see right) follows the DCCT cohort out to 17.5 years and concludes that intensive diabetes therapy has long-term beneficial effects on the risk of CVD in people with type 1 diabetes. Improved glycaemic control (a fall in HbA_{1c}) appeared to account for most of the benefit seen. The result is more striking in that after the initial 6.5-year study period there was no difference in HbA_{1c} between the two study groups as all individuals were offered intensive treatment.

The question now is how should this study affect diabetes management. It is, of course, another piece of evidence that tight glycaemic control from an early age is very important in reducing the impact of the disease. Perhaps as importantly, it focuses attention on cardiovascular risk management in a young population who by current standards would not receive lipid or other vascular interventions.

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. *New England Journal of Medicine* 329(14): 977–86

NEW ENGLAND JOURNAL OF MEDICINE



Intensive insulin therapy significantly lowers risk of CVD

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓✓

1 This study compared intensive with conventional therapy, with respect to their effect on the long-term incidence of cardiovascular disease (CVD).

2 Intensive therapy consisted of three or more daily injections of insulin or treatment with an external pump. Conventional therapy consisted of one or two daily injections of insulin.

3 Ninety-three per cent of the 1441 participants in the Diabetes Control and Complications Trial were followed up, for a mean of 17 years.

4 During this period, 46 CVD events occurred in 31 participants from the intensive therapy group compared with 98 events in 52 participants from the conventional therapy group. At study end, mean HbA_{1c} levels were 7.9% and 7.8% for the intensive and conventional treatment groups, respectively.

5 The authors claim their data demonstrate that intensive therapy reduces the risk of any CVD event

occurring by 42% (95% confidence interval [CI], 9–63%; *P*=0.02) and of non-fatal myocardial infarction, stroke and death from CVD by 57% (95% CI, 12–79%; *P*=0.02).

6 Differences between the intensive and conventional therapy groups remained significant after adjusting for microalbuminuria and albuminuria.

7 The study concludes that intensive therapy aimed at achieving normal glycaemic levels in people with type 1 diabetes, which in turn lowers CVD risk, will prove to have long-term health and economical benefits.

Nathan DM, Cleary PA, Backlund JY et al (2005) Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. *New England Journal of Medicine* 353(25): 2643–53

DIABETIC MEDICINE



CSII has benefits over NPH-based MDI

Readability	✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 The differences in quality of life and glycaemic control associated with continuous subcutaneous insulin infusion (CSII) and neutral protamine Hagedorn (NPH)-based multiple daily injections (MDI) were assessed (*n*=272).

2 HbA_{1c}, blood glucose and hypoglycaemic episodes were

considered in assessing quality of glycaemic control; three questionnaires were used to determine quality of life.

3 Treatment with CSII was linked to significant improvements in HbA_{1c}, mean blood glucose, fluctuations in blood glucose, mild and severe hypoglycaemic episodes, and quality of life.

4 The authors say that further studies are required to compare CSII with insulin detemir-based and insulin glargine-based MDI.

Hoogma RP, Hammond PJ, Gomis R (2006) Comparison of the effects of continuous subcutaneous insulin infusion (CSII) and NPH-based multiple daily insulin injections (MDI) on glycaemic control and quality of life: results of the 5-nations trial. *Diabetic Medicine* 23(2): 141–7