Management of type 1 diabetes

At what age should we treat cardiovascular risk factors?

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The commonest killer of people with diabetes remains cardiovascular disease. A number of studies have re-emphasised this in the past few months. The study by Pambianco and colleagues (see below) shows that although modern diabetes treatment has reduced the incidence of microvascular complications, we have had little effect on the risk of myocardial infarction or cardiovascular death.

Two papers using data from the UK General Practice Research Database confirm this (see the studies by Soedamah-Muthu et al, summarised on right and on page 154), with mortality rates, and particularly the risk of cardiovascular disease, remaining extremely high in individuals with type 1 diabetes. Being female usually confers protection from vascular disease and each study has shown that this protection is lost in the presence of diabetes.

The recent Canadian paper by Booth and colleagues (2006) has tried to interpret this message for us. Their study followed two populations with or without diabetes for a 6-year period up to 2000. They did not distinguish between type 1 or type 2 diabetes but found that people with diabetes entered a high-risk category for cardiovascular risk at a younger age than the control population. Their dramatic conclusion was that having diabetes confers an equivalent risk to having aged 15 years.

They follow this up with the statement that people with diabetes aged 40 years or younger do not appear to be at high risk. In looking at vascular risk (probably the most important risk for an individual with diabetes) distinguishing between type 1 and 2 diabetes is probably meaningless. Having raised blood glucose per se is associated with vascular risk. If this is the only risk, then perhaps 40 years is a reasonable age to consider starting cardioprotective treatment. But if you add to this central obesity, or hypertension, or an adverse lipid profile (and, perhaps more controversially, smoking), then perhaps we need to be discussing vascular risk with our patients at a much younger age, regardless of whether they have a label of type 1 or type 2 diabetes.

Booth GL, Kapral MK, Fung K, Tu JV (2006) Relation between age and cardiovascular disease in men and women with diabetes compared with non-diabetic people: a population-based retrospective cohort study. *Lancet* **368**(9529): 29–36

DIABETOLOGIA

All-cause mortality in type 1 diabetes in the UK

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

1 As it is not clear to what extent recent developments in diabetes care have improved the magnitude of excess mortality associated with type 1 diabetes, the authors of this study used data from the General Practice Research Database (GPRD) to generate up-to-date estimates of relative and absolute mortality rates.

2 Baseline in this study was 1 January 1992. People with type 1 diabetes (n=7713) were selected from the GPRD. Five age- and sex-matched individuals without any record of diabetes were selected as comparison subjects for each person with diabetes (n=38518).

3 Selected participants were followed until 1999. All-cause mortality rates were higher in the type 1 diabetes group compared to the group without diabetes (8.0 deaths per 1000 patient-years [95% confidence interval (CI) 7.2–8.9] versus 2.4 deaths per 1000 patient-years [95% CI 2.2–2.6]), corresponding to a hazard ratio (HR) of 3.7 (95% CI 3.2–4.3).

4 Sex-specific HRs were as follows: 4.5 (95% CI 3.5–5.6) for women with diabetes compared to women without diabetes; 3.3 (95% CI 2.7–4.0) for men with diabetes compared to men without diabetes.

5 The investigators concluded that, despite continuing improvements in diabetes care, type 1 diabetes is associated with greatly increased mortality rates, with CVD being the major cause of death.

Soedamah-Muthu SS, Fuller JH, Mulnier HE et al (2006) All-cause mortality rates in patients with type 1 diabetes mellitus compared with a non-diabetic population from the UK general practice research database, 1992–1999. *Diabetologia* **49**(4): 660–6

DIABETES

30-year changes in incidence of diabetes complications

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

1 This study aimed to report the cumulative incidence of major complications of type 1 diabetes, by diagnosis year and duration of diabetes, in the Pittsburgh Epidemiology of Diabetes Complications study.

2 Over 900 participants were stratified according to year of diabetes diagnosis, and the cumulative incidence of diabetes complications was assessed at 20, 25 and 30 years' diabetes duration.

3 As diagnosis year became later, the incidence of mortality, renal failure and neuropathy decreased ($P<0.05$).

4 Coronary artery disease event rates, however, showed no statistically significant changes based on year of diagnosis.

5 The authors concluded that while the incidence of some diabetes complications is declining, there have been less favourable changes for others at diabetes duration up to 30 years.

Pambianco G, Costacou T, Ellis D et al (2006) The 30-year natural history of type 1 diabetes complications. *Diabetes* **55**(5): 1463–9

'Despite advances in the care of type 1 diabetes, the condition remains associated with extremely high relative and absolute risks of cardiovascular disease.'

DIABETES CARE

Short sprint fends off hypoglycaemia

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

1 This study aimed to test whether a short sprint could prevent hypoglycaemia after moderate-intensity exercise in type 1 diabetes.

2 Seven males undertook 20 minutes of exercise before immediately resting or completing a 10-second cycle sprint.

3 The sprint opposed further falls in glycaemia for 120 minutes, whereas glycaemia decreased further in those who rested.

Bussau VA et al (2006) The 10-s maximal sprint: a novel approach to counter an exercise-mediated fall in glycemia in individuals with type 1 diabetes. *Diabetes Care* **29**(3):601–6.

DIABETES CARE

CVD risk remains high in the UK

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

1 This study aimed to estimate the risk of cardiovascular disease (CVD) in type 1 diabetes in the UK.

2 The General Practice Research Database was used to identify 7479 people with type 1 diabetes. Five matched participants without diabetes were selected as controls for each person with diabetes.

3 Data on major CVD events (myocardial infarction, acute coronary heart disease death, coronary revascularisation, or stroke) were collected for the period between 1992 and 1999.

4 The risk of major CVD was significantly greater in those with diabetes compared to those without (hazard ratio [HR] 3.6 for men [95% confidence interval (CI) 2.9–4.5] and 7.7 for women [95% CI 5.5–10.7]).

5 The absolute risk of CVD in men with type 1 diabetes aged 45–55 years was similar to that of men without diabetes aged between 10 and 15 years older. This difference was even more marked in women with versus those without diabetes.

6 The authors concluded that, despite advances in the care of type 1 diabetes, the condition remains associated with extremely high relative and absolute risks of CVD. The relative risk attributable to diabetes is greater in women, rather than men, with diabetes.

Soedamah-Muthu SS, Fuller JH, Mulnier HE et al (2006) High risk of cardiovascular disease in patients with type 1 diabetes in the U.K.: a cohort study using the general practice research database. *Diabetes Care* **29**(4): 798–804

DIABETOLOGIA

Space–time clustering of type 1

Readability	✓
Applicability to practice	✓
WOW! factor	✓

1 This study aimed to investigate space–time clustering of type 1 diabetes in Yorkshire, UK, since infections have been implicated in the aetiology of the condition.

2 Statistically significant space–time clustering of the condition was observed in groups aged 0–14 years (P=0.04) and 15–19 years (P=0.01).

3 The authors concluded that this is consistent with an aetiology involving infection.

McNally RJQ, Feltbower RG, Parker L et al (2006) Space–time clustering analyses of type 1 diabetes among 0- to 29-year-olds in Yorkshire, UK. *Diabetologia* **49**(5): 900–4

DIABETOLOGIA

Efficacy and safety of human insulin inhalation powder

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

1 This study marks the first investigation of the efficacy of human insulin inhalation powder (HIIP) delivered with a small, breath-actuated device.

2 The open-label, 2-period crossover study randomised participants with type 1 diabetes (n=139) to receive pre-prandial HIIP plus insulin glargine (12 weeks), followed by subcutaneous insulin (lispro or regular) plus insulin glargine (for a further 12 weeks), or the reverse treatment sequence.

3 The primary efficacy measure was HbA_{1c} at the end of each treatment phase. HbA_{1c} at the end of treatment with HIIP was 7.95±0.12% compared with 8.06±0.12% for subcutaneous insulin administration.

4 HbA_{1c} values at the end of the two treatment periods were not significantly different between the treatment groups (P=0.74 and P=0.39). The HIIP regimen was concluded to be non-inferior to the subcutaneous regimen in terms of glycaemic control.

5 The HIIP regimen was also associated with lower fasting blood glucose levels than the subcutaneous regimen (8.09±0.33 mmol/l versus 9.05±0.33 mmol/l, respectively; P=0.01).

Garg S, Rosenstock J, Silverman BL et al (2006) Efficacy and safety of preprandial human insulin inhalation powder versus injectable insulin in patients with type 1 diabetes. *Diabetologia* **49**(5): 891–9

'The human insulin inhalation powder regimen was concluded to be non-inferior to the subcutaneous regimen in terms of glycaemic control.'