Management of type 1 diabetes

DAFNE: a better quality of life can be taught

Daniel Flanagan, Consultant Physician, Derriford Hospital, Plymouth

For a person with type 1 diabetes, day-to-day living is a complex business: balancing carbohydrate intake, insulin dosage and exercise is not an easy task. If we all ate exactly the same thing every day and performed exactly the same exercise, then taking a fixed dose of insulin every day would probably work reasonably well. Of course, no individual does this and the obvious conclusion is that the insulin dose needs to be adjusted dose by dose.

A proportion of people grasp this principle and teach themselves, by trial and error, to adjust their insulin dose. However, this is rarely because they have received specific help from clinicians. For a large proportion of patients the solution – to avoid hypoglycaemia – is to run their blood glucose at a level that we now know puts them at risk of the microvascular complications of diabetes.

It seems obvious that managing this complex balance requires specific training, but very rarely is this provided in a structured fashion. There are a number of reasons why we do not provide this service, including lack of staff. Perhaps a more important reason is that clinicians in the past have not been formally trained to be teachers.

The Dose Adjustment For Normal Eating (DAFNE) study group has addressed this issue by targeting the second group of patients mentioned above. They have taken a group of patients with type 1 diabetes and poor glycaemic control and offered them a structured 5-day course, teaching them flexible insulin adjustment. Not surprisingly, the results show that HbA_{1c} fell and the patients felt better.

The importance of the paper is perhaps not the result but that it shows us that this can be done within the resources available outside of a research facility. The programme is now being expanded to a number of other centres around the UK. This, or something similar, must be the model of future diabetes care.

BRITISH MEDICAL JOURNAL

DAFNE gives patients greater dietary freedom

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

1 Few patients with type 1 diabetes currently attain ideal glycaemic control and thus an improved quality of life.

2 A training programme in intensive insulin treatment, developed in Germany, in which participants match insulin doses to their food choices, has shown sustained improvements in glycaemic control.

3 This study tested the use of this approach in a UK multicentre randomised controlled study, measuring biomedical and psychological outcomes.

4 169 participants were recruited from hospital diabetes clinics in three English health districts. All were adults with type 1 diabetes and moderate or poor glycaemic control.

5 At 6 months, HbA_{1c} was significantly better in participants (mean 8.4%) than in controls (9.4%) ($t=6.1$, $P<0.0001$). Dietary freedom significantly improved ($t=-5.4$, $P<0.0001$), as did the impact of diabetes on quality of life ($t=2.9$, $P<0.01$). General wellbeing and treatment satisfaction also improved.

6 Improvements in 'present quality of life' were not significant at 6 months but were significant at 1 year.

7 This training improved glycaemic control, treatment satisfaction, psychological wellbeing and the quality of life in people with type 1 diabetes.

8 The use of this approach might lead more people to adopt intensive self-management successfully.

DAFNE Study Group (2002) Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomised controlled trial. *British Medical Journal* **325**: 746–51

DIABETIC MEDICINE

Abnormal thermal perception in young people with diabetes

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

1 Symptomatic peripheral neuropathy is not common in children and adolescents with type 1 diabetes.

2 This study determined thermal and pain thresholds in the upper and lower limbs of 35 neurologically asymptomatic patients (aged 8–16 years) and 35 healthy age-matched subjects, using quantitative sensory testing. It also studied clinical parameters in relation to these sensory thresholds in subclinical diabetic neuropathy.

3 Patients with diabetes had increased thresholds for warmth in the hand, and for cold and warmth in the foot, compared with controls.

4 43% of subjects with diabetes had an abnormality of at least one sensory threshold.

5 There was a significant correlation for duration of diabetes and heat-induced pain threshold in the hand.

6 Abnormal cutaneous thermal perception was common in both upper and lower limbs in neurologically asymptomatic young patients with diabetes. The heat-induced pain threshold in the hand correlated with duration of diabetes.

Abad F, Diaz-Gomez NM, Rodriguez I et al (2002) Subclinical pain and thermal sensory dysfunction in children and adolescents with type 1 diabetes mellitus. *Diabetic Medicine* **19**(10): 827–31

'Younger age, male sex, longer diabetes duration, and >3 daily insulin injections were found to be significant predictors of hypoglycaemia.'

'Among patients with diabetes and acute myocardial infarction, primary angioplasty was associated with reduced early and late adverse events compared with fibrinolytic treatment.'

MEDICAL JOURNAL OF AUSTRALIA

Audit of predictors of hypoglycaemia in young patients

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

1 The predictors of glycaemic control in young people with diabetes are probably multifactorial.

2 The risk of severe hypoglycaemia in children and fear of weight gain in adolescents might be impediments to achieving glycaemic control for this population.

3 This multicentre population-based study audited glycaemic control and severe hypoglycaemia, defined by unconsciousness or seizures, in 1190 children and adolescents with type 1 diabetes in New South Wales and Australian Capital Territory.

4 At least one episode of severe hypoglycaemia in the previous 3 months was reported by 6.7% of the sample. The rate of severe hypoglycaemia was 36/100 patient-years.

5 Younger age, male sex, longer diabetes duration, and >3 daily insulin injections, but not HbA_{1c} level, were found to be significant predictors of hypoglycaemia.

6 Children with diabetes had higher BMI standard deviation scores than population standards. Those in the highest quartile were younger, had shorter diabetes duration and higher HbA_{1c} level.

7 Children with longer diabetes duration are at increased risk of suboptimal glycaemic control and severe hypoglycaemia.

Craig ME, Handelsman P, Donaghue KC et al for the NSW/ACT HbA_{1c} Study Group (2002) Predictors of glycaemic control and hypoglycaemia in children and adolescents with type 1 diabetes from NSW and the ACT. *Medical Journal of Australia* **177**: 235–8

JOURNAL OF EPIDEMIOLOGY AND COMMUNITY HEALTH

Hyperglycaemia on admission for MI worsens prognosis

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

1 Patients with diabetes who have a myocardial infarction (MI) have a worse short-term prognosis than non-diabetic patients.

2 This study assessed whether hyperglycaemia on or during admission was associated with worse 28-day mortality in patients with MI.

3 Glycaemia >6.67 mmol/l was taken as hyperglycaemia.

4 Of 652 patients with MI, 29.7% had previously known diabetes, but 69.0% had glycaemia >6.67 mmol/l on admission.

5 Patients with hyperglycaemia were found to be older, more often female, more frequently had a previous diagnosis of diabetes, developed more complications and had a higher 28-day mortality.

6 The effect of admission glycaemia >6.67 mmol/l on 28-day mortality was independent of major compounding factors, particularly previous diagnosis of diabetes.

Sala J, Masia R, Gonzalez de Molina FJ et al (2002) Short-term mortality of myocardial infarction patients with diabetes or hyperglycaemia during admission. *Journal of Epidemiology and Community Health* **56**: 707–12

HEART

Comparison of outcomes of PTCA and fibrinolysis

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

1 Primary percutaneous transluminal coronary angioplasty (PTCA) is known to provide better clinical outcomes than fibrinolysis for acute myocardial infarction (AMI) in general.

2 The effect of PTCA on patients with diabetes and AMI, however, is unclear.

3 This study compared early and late outcomes of PTCA with fibrinolytic treatment for AMI among patients with diabetes. It was a retrospective observational study with data obtained from prospective registries.

4 The sample analysed consisted of 202 patients with diabetes and AMI who received reperfusion treatment within 6 hours of symptom onset.

5 Of these, 99 patients received fibrinolysis, while the remaining 103 underwent primary PTCA. Most patients undergoing PTCA also received adjunctive stenting and glycoprotein IIb/IIIa inhibition.

6 Rates for in-hospital recurrent ischaemia and target vessel revascularisation at one year were lower in those treated with PTCA.

7 Death or reinfarction rates were lower in those treated with PTCA.

8 Among patients with diabetes and AMI, therefore, primary PTCA was associated with reduced early and late adverse events compared with fibrinolytic treatment.

Hsu LF, Mak KH, Lau KW et al (2002) Clinical outcomes of patients with diabetes mellitus and acute myocardial infarction treated with primary angioplasty or fibrinolysis. *Heart* **88**: 260–5