Management & prevention of type 2 diabetes

DIABETIC MEDICINE

Tablet dispenser improves adherence

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

1 By improving adherence to prescribed therapies, people with type 2 diabetes should see an improvement in their HbA_{1c} levels. This article assessed whether a simple tablet dispensing device could improve glycaemic control by improving adherence to therapy. The primary endpoint was changes in HbA_{1c}, which would reflect adherence, say the authors.

2 The study was randomised, open label with two parallel groups in design. Participants (n=2081) were randomised to receive a tablet dispenser (TD) or no intervention (control).

3 Intervention lasted for 6 months. HbA_{1c} was compared between the groups at baseline and at study end.

4 Age, gender distribution, body mass index, blood pressure and HbA_{1c} were comparable between the two groups at baseline.

5 At study end HbA_{1c} improvement was observed in the TD and control groups, although it was significantly greater in the TD group ($P<0.0001$). Multiple regression analysis showed that having a TD remained an independent predictor of improved glycaemic control.

6 Sub-group analysis showed that improvement in HbA_{1c} levels was greater in those on more medications for control of their diabetes, in those on more medications per day and in younger people.

7 The authors conclude that, as having a TD improved HbA_{1c} levels more in those on more medications, the device is useful in improving adherence to therapy.

Maier C, Mustapic D, Schuster E et al (2006) Effect of a pocket-size tablet dispensing device on patients glycaemic control in type 2 diabetic patients. *Diabetic Medicine* **23**(1): 40–5

Simple tablet dispensing device could improve adherence

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People with type 2 diabetes may often be taking tablets. They may be taking two to four for blood pressure, around four for glycaemia, a statin for cholesterol, as well as aspirin and other tablets for unrelated co-morbidities.

No wonder, therefore, that studies show that people with type 2 diabetes often do not take the right number of prescribed tablets the correct number of times a day. What can be done to improve adherence to therapy?

Maier and colleagues (paper abstracted on left) report on a prospective randomised open-label study with two parallel groups of around 1000 people with type 2 diabetes in each.

One group were given a pocket-sized tablet dispenser and brief instructions for its use. The dispenser can hold 1 day's tablets in up to three doses. The participants were told to fill the dispenser themselves each day with that day's tablets. The other group had no intervention.

After 6 months both groups had lowered their HbA_{1c} levels: by an average of 0.74% in the intervention group and 0.53% in the control group; the difference between the two was statistically significant ($P<0.0001$). In the sub-group analysis the effect was more pronounced in participants who were receiving more medications, in those receiving more diabetes medications, and in younger participants.

The authors conclude that, in this large study population in a 'realistic' setting, a simple tablet dispensing device leads to a significant and clinically relevant improvement in HbA_{1c}. Participants with more complex therapy regimens had the greater benefit, suggesting that the tablet dispensing device improved adherence to therapy.

Perhaps we in the UK (the study was based in Austria) should consider recommending such a simple step to improve adherence in those with complex tablet regimens.

DIABETIC MEDICINE

Epidemiological model can predict diabetes prevalence

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

1 In order to support healthcare planning and delivery the authors aimed to estimate the prevalence of diagnosed and undiagnosed diabetes in England by using an epidemiological model.

2 Age–sex–ethnic-specific reference prevalence rates from epidemiological studies were matched to the English population (data from 2001 census) at the national, regional and local authority/primary care trust levels.

3 The model found diabetes prevalence in 2001 to be 4.41% (~2 168 000 people). Of this number 92.3% people have type 2 and 7.7% have type 1 diabetes (~2 002 000 and ~166 000 people, respectively). Diabetes prevalence was higher in women than men, and higher in ethnic minority groups than European Caucasians; and prevalence rose markedly with increasing age.

4 The authors state that their model is able to predict diabetes prevalence for any defined population size – for example, for a ward or a general practice population.

5 The authors conclude that self-reported prevalence rates of diabetes do not give a true picture of actual prevalence, and that the described model, by providing reliable data, can be used to help implement the National Service Framework for diabetes and can also be used to estimate prevalence rates in all of the UK.

Forouhi NG, Merrick D, Goyder E et al (2006) Diabetes prevalence in England, 2001–estimates from an epidemiological model. *Diabetic Medicine* **23**(2): 189–97

'Pharmacological intervention for glycaemic improvement results in a cognitive benefit.'

DIABETES CARE

Specific risk scores not suitable across all population sub-groups

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

1 Risk scores developed for a certain population sub-group may not be suitable for another because of differing risk factors between them. This article aimed to evaluate whether a typical risk score for undiagnosed type 2 diabetes that was developed for a Caucasian population can be applied to populations with a diverse ethnic make up.

2 The DETECT-2 project is an international collaboration that collects data on factors related to screening for type 2 diabetes, particularly with regard to ethnic background. Data from >190 000 people from 52 centres across 34 countries have been collected to date.

3 For the purposes of this study, nine cross-sectional studies that represented diverse backgrounds were chosen, giving a total of 29 758 individuals, of whom 1805 had undiagnosed diabetes. The risk score used was the Rotterdam Predictive Model (RPM).

4 The RPM's specificity and sensitivity rates varied widely when used in non-Caucasian populations.

5 The authors conclude that their study demonstrates that risk scores developed for Caucasian populations, such as the RPM, can not be extrapolated to populations of diverse ethnic backgrounds.

Glumer C, Vistisen D, Borch-Johnsen K, Colagiuri S; DETECT-2 collaboration (2006) Risk scores for type 2 diabetes can be applied in some populations but not all. *Diabetes Care* **29**(2): 410–4

DIABETIC MEDICINE

Screening for type 2 diabetes in A&E is a feasible venture

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

1 The authors aimed to examine whether the identification of type 2 diabetes is feasible in an accident and emergency (A&E) department.

2 Of 500 consecutive attendees to the authors' A&E department, 73 already had diagnosed type 2 diabetes. Those who were found to have capillary blood glucose >7.0 mmol/l (n=36) returned for fasting blood tests: 13 (2.6 %) were subsequently diagnosed as having type 2 diabetes; eight (1.6 %) had impaired fasting blood glucose; and 15 had normal fasting glucose levels.

3 Therefore, the total prevalence of type 2 diabetes, found as a direct result of screening in the A&E department, was 17.2 %, with 2.6 % newly diagnosed. As those attending A&E may have stress-induced hyperglycaemia, blood tests were taken at least 1 week after their visit to the department.

4 The authors also found that body mass index was significantly higher in those with type 2 diabetes; they also had a higher chance of having a family history of the condition.

5 The authors conclude that this case-finding methodology could identify a further 539 incidences of people with type 2 diabetes, who are over the age of 40 years, attending their A&E department annually.

George PM, Valabhji J, Dawood M, Henry JA (2006) Screening for type 2 diabetes in the accident and emergency department. *Diabetic Medicine* **22**(12): 1766–9

'The authors conclude that this case-finding methodology could identify a further 539 incidences of people with type 2 diabetes, who are over the age of 40 years, attending their A&E department annually.'

DIABETES CARE

Pharmacological intervention has cognitive benefit

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

1 This study examined whether improved metabolic control can improve diabetes-related cognitive dysfunction in people with type 2 diabetes.

2 One-hundred and forty-five people were recruited into this randomised double-blind trial based in the US. None had any evidence of existing dementia or depression. Participants were already receiving metformin monotherapy; they had rosiglitazone or glyburide added. The study lasted for 24 weeks.

3 Cognitive function at baseline was assessed using three tests: the Digit Symbol Substitution Test (DSST); the Rey Auditory Verbal Learning Test (RAVLT); and the Cambridge Neuropsychological Test Automated Battery (CANTAB).

4 Fasting plasma glucose (FPG) was similar in the two groups at study start. The two groups demonstrated similar significant FPG reductions at study end.

5 Working memory significantly improved with rosiglitazone and glyburide add-on therapy. The CANTAB Paired associated Learning Test demonstrated the greatest improvement in working memory and was significantly associated with FPG reduction.

6 The data suggest that pharmacological intervention for glycaemic improvement results in a cognitive benefit, conclude the authors.

Ryan CM, Freed MI, Rood JA et al (2006) Improving metabolic control leads to better working memory in adults with type 2 diabetes. *Diabetes Care* **29**(2): 345–51

DIABETES, OBESITY AND METABOLISM

Once-daily BIAsp 30 helps achieve glycaemic control

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

1 American Association of Clinical Endocrinologists, International Diabetes Federation and American Diabetes Association glycaemic targets were used for 100 participants with type 2 diabetes in this observational study.

2 The participants had HbA_{1c} levels between 7.5% and 10% and were poorly controlled on oral antidiabetic agents (OADs). They discontinued their previous basal insulin and switched to one injection of biphasic insulin aspart 70/30 (BIAsp 30) prior to their main evening meal.

3 With help from the authors, the participants titrated their own insulin to achieve pre-breakfast fasting blood glucose of 80–110 mg/dl. Over time a further two injections were added incrementally if glycaemic control remained poor with respect to the societies' targets.

4 The authors conclude that initiation of once-daily BIAsp 30 is a safe and efficient method of achieving glycaemic control for those with type 2 diabetes and poor control using OADs alone.

Garber AJ, Wahlen, J, Wahl T et al (2006) Attainment of glycaemic goals in type 2 diabetes with once-, twice-, or thrice-daily dosing with biphasic insulin aspart 70/30 (The 1-2-3 study). *Diabetes, Obesity and Metabolism* **8**(1): 58–66

DIABETES RESEARCH AND CLINICAL PRACTICE

Insulin glargine offers long-term treatment hope

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

1 As a ≤28-month long-term extension of a 52-week open-label, multinational and multicentre trial of 570 people with type 2 diabetes, this trial aimed to observe the long-term effects of insulin glargine as add-on therapy to oral hypoglycaemic agents (OHAs). Of 239 people invited, a total of 198 people completed the extension trial.

2 From a baseline of 9.44% at the start of the original 52-week study, HbA_{1c} was reduced by a mean of 1.02% at end of the long-term follow up.

3 Compared with the original study, no new or unexpected adverse treatments were observed. Of all adverse events reported, four were deemed to be as a possible result of treatment with insulin glargine. The most common serious diagnosed adverse events were bone fracture (n=4; 1.7%), pneumonia (n=4; 1.7%) and myocardial infarction (n=3; 1.3%).

4 The authors conclude that the long-term use of insulin glargine, with OHAs, is well tolerated in people with type 2 diabetes. Therefore, this therapy offers an option for the long-term treatment of type 2 diabetes.

Kacerovsky-Bielesz G, Dressler A, Freunscht R (2006) Long-term glycaemic control with insulin glargine in type 2 diabetes. *Diabetes Research and Clinical Practice* **71**(2): 184–91

DIABETES CARE

Computer model predicts 'cost' of diabetes

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

1 The authors have developed and validated a computer simulation model which is capable of predicting and assessing the impact that screening, prevention and treatment modalities have on type 2 diabetes, its co-morbidities, complications, quality of life and monetary costs.

2 The predictions were assessed against existing Wisconsin Epidemiological Study of Diabetic Retinopathy (WESDR) data.

3 Validation data indicate that the computer model accurately predicts survival, microvascular and neuropathic complications in people from the WESDR, the authors conclude.

Zhou H, Isaman DJM, Messinger S et al (2006) A computer simulation model of diabetes progression, quality of life, and cost. *Diabetes Care* **28**(12): 2856–63