Paediatrics

DIABETIC MEDICINE

HbA_{1c} not improved after an increase in insulin injections

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

1 The DIABAUD programme was set up to audit glycaemic control and insulin regimens in children under 15 years with type 1 diabetes in Scotland.

2 DIABAUD 2 (D2; 1997–99) found the average age of 1755 children with type 1 diabetes in Scotland was 10.2 years, with a high mean HbA_{1c} of 9.0%; 94% of children were on twice-daily insulin regimens.

3 The purpose of DIABAUD 3 (D3; 2002–04) was to find whether glycaemic control had improved in this group and to examine whether switching to three insulin injections a day improved overall HbA_{1c}.

4 D3 comprised 1147 children aged 1.1–14.9 years. The mean HbA_{1c} was 9.2%±1.5, with only 9.7% achieving a target HbA_{1c} of <7.5%.

5 The number of children in D3 on two insulin injections a day was 51% (94% in D2), on three insulin injections a day was 43% (2% in D2) and on four or more insulin injections a day was 2.3% (1.9% in D2). Mean HbA_{1c} did not differ significantly between these groups. After adjustment for other variables, insulin regimen was not a significant predictor of HbA_{1c}.

6 In both D2 and D3 cohorts, HbA_{1c} increased with age from 4–14 years, with both studies showing a high HbA_{1c} in early childhood (<4 years).

7 The glycaemic control in children with type 1 diabetes in Scotland failed to improve over 4 years, despite an increased number of children on three insulin injections a day.

Scottish Study Group for the Care of the Young with Diabetes (2006) A longitudinal observational study of insulin therapy and glycaemic control in Scottish children with Type 1 diabetes: DIABAUD 3. *Diabetic Medicine* **23**: 1216–21

Insulin regimens in childhood diabetes

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One of the challenges of managing childhood diabetes is the choice of insulin regimen. Paediatricians will look after children from the age of a few weeks, with rare forms of neonatal diabetes, to adolescents and young adults in joint services with adult colleagues. Children and their families come from a wide variety of social backgrounds and will vary in their individual skill base. There will also be children with special needs for whom the added burden of diabetes may prove immense.

The choice of insulin regimen will therefore involve a consideration of all of these factors, followed by a multidisciplinary team discussion and finally a negotiation with the child and family. An evidence base for insulin management sometimes feels rather extravagant yet such information is vital when considering the complex needs of children.

Traditionally in the UK children have been started on twice-daily mixtures of insulin for practical reasons. We have fallen far behind diabetologists on the Continent or in the US where multiple daily injection (MDI) regimens or pump therapy are much more common. Yet are there good data to suggest that MDI are better? The practical considerations of performing a well-designed randomised controlled trial, which by definition would need to be at least multicentre if not multinational, means that there are few robust data. Some studies have examined very specific questions such as the rate of hypoglycaemia on different insulin regimens or, as in this study by the Scottish Study Group, summarised on the left, have involved a collaboration of paediatric clinics that have performed observational studies over time. The larger studies, which include the Hvidore Study Group, have suggested that intensive insulin regimens have little impact on glycosylated haemoglobin. The Scottish Study Group found that children moving from a twice-daily regimen to a three-times daily regimen failed to improve their HbA_{1c} and in this study only 10% of Scottish children achieved an HbA_{1c} of less than 7.5%: the NICE target value. The problem with these studies is that HbA_{1c} is reasonably easy to measure but there are so many other variables which influence diabetes management outcomes.

Other studies suggest that factors such as diabetes team experience or access to out-of-hours advice are important. So what does this mean? It means that properly designed RCTs do need to be done to examine the benefits of different insulin regimens but not just in terms of HbA_{1c}. A greater understanding of the barriers to tight glycaemic control is also essential if diabetes care in childhood is to be improved.

DIABETES CARE

Childhood obesity risk lessened by breast feeding

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

1 The authors of this study aim to determine if maternal weight status or diabetes is contrary to a recent report indicating that breastfeeding reduces childhood obesity.

2 There were 15253 children involved in the study, all aged between 9 and 14 years old in 1996. Maternal diabetes and weight were obtained from mothers as was method of infant feeding.

3 Estimates of childhood obesity were obtained from self-reported height and weight to calculate BMI, these were then based on the Centers for Disease Control and Prevention definitions for normal, at-risk for overweight and overweight.

4 In all children breast feeding was associated with reduced obesity. Results did not differ depending on maternal weight or diabetes.

5 The data from this study support previous studies on the benefit of breast feeding in relation to childhood obesity.

Mayer-Davis EJ, Rifas-Shiman LS, Zhou L et al (2006) Breast-feeding and risk for childhood obesity: does maternal diabetes or obesity status matter? *Diabetes Care* **29**: 2231–7

PAEDIATRIC DIABETES

Telephone support does not improve HbA_{1c} level

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

1 A randomised controlled trial of 123 children aged 3–16 years (mean age 11.9 years) with type 1 diabetes (mean duration 3.65 years) was used to determine whether bimonthly telephone support in addition to normal care improved HbA_{1c} level.

2 The control group comprised 63 children who received normal care for their diabetes. The intervention group comprised 60 children who received bimonthly telephone discussions lasting 15–30 minutes from a paediatric diabetes educator over 7 months in addition to normal care.

3 The telephone discussions covered insulin doses, which were varied as necessary, and events that may impact on diabetes management, and provided an educational programme.

4 The main outcome was change in HbA_{1c} level. Admission rates and changes in diabetes knowledge, psychological parameters, compliance and understanding were also observed.

5 There was a significant increase in the mean HbA_{1c} level of children in both groups (from 8.32% to 8.82% in the control group and from 8.15% to 8.85% in the intervention group). This can be partly explained by the seasonal variation in HbA_{1c} level.

6 Both groups showed an increase in admissions of 0.2 per year, with no improvement in diabetes knowledge, compliance or psychological parameters. The intervention group perceived their contact with the clinic as helpful, despite showing no improved control.

Nunn E, King B, Smart C, Anderson D (2006) A randomized controlled trial of telephone calls to young patients with poorly controlled type 1 diabetes. *Paediatric Diabetes* **7**: 254–9

DIABETES RESEARCH AND CLINICAL PRACTICE

Breakfast insulin gives better control

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

1 The authors investigated the effect of administration time of insulin glargine (IG) on glycaemic control in 31 children and adolescents (7–17 years) with type 1 diabetes.

2 For 6 months, 15 young people received once-daily IG at breakfast and 16 received once-daily IG at bedtime, in addition to insulin aspart premeals; this was well tolerated with no adverse effects.

3 The number of hypoglycaemic events decreased in both the IG breakfast and bedtime groups.

4 In the IG breakfast group, HbA_{1c} level was significantly lower after 6 months, whereas there was no significant change in the IG bedtime group.

Karaguzel G, Satilmis A, Akçurin S, Bircan I (2006) Comparison of breakfast and bedtime administration of insulin glargine in children and adolescents with Type 1 diabetes. *Diabetes Research and Clinical Practice* **74**: 15–20

DIABETES CARE

Coeliac children are at greater risk of type 1 diabetes

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

1 This study looks at the risk of type 1 diabetes in individuals with coeliac disease. The authors attempt to determine the risk, in those under 20 years of age, of subsequent type 1 diabetes.

2 The Swedish national inpatient register was used to identify 9243 children with coeliac disease between 1964 and 2003. Only those with at least one-year of follow up data were included.

3 Before the age of 20 years, coeliac disease is associated with a significantly increased risk of type 1 diabetes. This risk was observed regardless of the time of diagnosis of coeliac disease. These individuals were also at an increased risk of both diabetic coma and ketoacidosis before the age of 20 years.

4 The authors conclude that those individuals under 20 years old with coeliac disease are at high risk of developing type 1 diabetes, this may still be lower than expected considering 95% of those with coeliac disease express an HLA protein (HLA-DQ2 or HLA-DQ8) thought to be associated with diabetes.

Ludvigsson JF, Ludvigsson J, Ekbom A, Montgomery SM (2006) Celiac disease and risk of subsequent type 1 diabetes: a general population cohort study of children and adolescents. *Diabetes Care* **29**: 2483–8

ARCHIVES OF MEDICAL RESEARCH

Lipid abnormalities linked with family history of diabetes

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

1 A random sample of 439 healthy children, aged 10–13 years, with a normal body weight were studied to determine the prevalence of disorders in lipid profile and to establish links with a family history (FH) of high blood pressure, type 2 diabetes and obesity.

2 A high proportion of the non-obese, healthy children exhibited an adverse lipid profile, independently associated with a FH of type 2 diabetes but not with a FH of obesity or high blood pressure.

3 Dyslipidaemia may be genetically determined and linked with a FH of type 2 diabetes. Screening of at-risk people should be focussed in early childhood to reduce cardiovascular risk.

Guerrero-Romero F, Rodríguez-Moran M (2006) Prevalence of dyslipidemia in non-obese prepubertal children and its association with family history of diabetes, high blood pressure, and obesity. *Archives of Medical Research* **37**: 1015–21

"In the IG breakfast group, HbA1c level was significantly lower after 6 months, whereas there was no significant change in the IG bedtime group."