Young people with diabetes: Better outcomes are needed

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"A triumph of hope over experience" was the way a friend described my cycle trip from Land's End to John O'Groats last year – I'm not sure if he was being genuinely celebratory or sarcastic. Having read the article by Murphy and colleagues (2012; summarised alongside) and Mike Robling et al's report of the DEPICTED study (2012; summarised below), one can't help but think that a 1300 mile end-to-end cycle (the long route) has a far greater chance of a positive outcome than an intervention study in young people with diabetes.

The recent National Diabetes Audit Mortality Analysis 2007–2008 highlighted that in people with T1D in the UK there are approximately 2.5 times more deaths expected compared with the background mortality rates, with the excess mortality much greater in young adults in the 15–34 age group. Compared with sex-specific background mortality rates, mortality in male and females with T1D was found to be approximately four and nine times greater, respectively (The NHS Information Centre for Health and Social Care, 2011). Results from numerous studies have emphasised the difficulties of helping young people achieve satisfactory glycaemic control. In our own adolescent clinic in Sheffield, the mean HbA_{1c} varies year-on-year between 80 and 85 mmol/mol (9.5–9.9%) – not something we are proud of.

Insulin resistance, insulin omission, weight gain avoidance, dysfunctional families, poor numeracy skills (as discussed by Marden et al, 2012; summarised on the facing page) and lack of engagement are all contributory factors to poor glycaemic control in young people. The rates of hypoglycaemia reported by Katz et al (2012; summarised on the facing page) are shockingly high. There is perhaps nothing more powerful than a severe hypoglycaemic event to de-motivate someone from achieving tight glycaemic control.

Whilst experience suggests that intervention studies in adolescents with T1D are doomed to failure, we must not stop hoping that initiatives, such as the new Best Practice Tariff for Paediatric Diabetes, new technologies, better insulins and appropriate psychological support will help us to achieve better outcomes in young people with diabetes. They deserve it.

The NHS Information Centre for Health and Social Care (2011) *National Diabetes Audit Mortality Analysis 2007–2008*. The NHS Information Centre, Leeds. Available at: http://bit.ly/rDi1lr (accessed 11.09.12)

BMJ

Diabetes consulting skills, glycaemic control and QoL

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

1 Psychoeducational interventions can improve glycaemic control when delivered by experienced practitioners. The authors sought to investigate the effect of a practitioner-training programme on HbA_{1c} and secondary outcomes in young people aged 4–15 years with T1D.

2 Secondary care centres in the UK (n=26) were randomly assigned either to training using the "Talking Diabetes" programme, which puts patients at the centre of the consultation, or to a control group.

3 At baseline and 1 year, HbA_{1c} was measured and secondary outcomes were recorded using questionnaires.

4 There was no significant reduction in HbA_{1c}, or secondary outcome improvements in either study group. Carers' perceptions of continuity of care improved significantly in the intervention group (P=0.01) and declined in the control group.

5 The authors concluded that the "Talking Diabetes" intervention did not improve glycaemic control in young people with T1D and had a negative effect on some aspects of quality of life.

Robling M, McNamara R, Bennert K et al (2012) The effect of the Talking Diabetes consulting skills intervention on glycaemic control and quality of life in children with type 1 diabetes: (DEPICTED study). *BMJ* **344**: e2359

DIABETIC MEDICINE

Adolescents with T1D: Family-centred education

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

1 Adolescents with T1D characteristically achieve poor glycaemic control. It is thought that family-based interventions will have a greater impact on adolescent glycaemic control than conventional skills-based education programmes.

2 The authors compared the effect of the FACTS (Families and Adolescents Communication and Teamwork Study) diabetes education programme with conventional treatment on clinical and psychosocial outcomes in adolescents with T1D.

3 Participants (n=305, age 13.1 ±1.9 years) were randomly allocated to either the FACTS (six 90-minute monthly group education sessions attended by parents and adolescents) programme or to conventional clinical care (four 3-monthly outpatient clinic appointments); subjects were followed up for 12 months.

4 Group education session attendance was poor with 30% of families attending no sessions. Biochemical and psychosocial outcomes were comparable between the two groups; at 18 months, there was no significant change in HbA_{1c} in either group.

5 The authors concluded that attendance at group education sessions is a major challenge and that changing to a more personalised approach may be beneficial in motivating families to commit to such programmes.

Murphy HR, Wadham C, Hassler-Hurst J et al (2012) Results from a randomized trial of a diabetes self-management education and family teamwork intervention in adolescents with type 1 diabetes. *Diabet Med* 16 Apr [Epub ahead of print]

DIABETIC MEDICINE

Poor numeracy skills and glycaemic control in T1D

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

1 The authors of the present study aimed to investigate the relationship between numeracy and literacy skills and achieved glycaemic control in adults with T1D, and whether any associations were independent of other variables including diabetes duration, education, age, sex and socio-economic factors.

2 A total of 112 adults (aged 18–65 years) with T1D were randomly selected from the Bournemouth Diabetes and Endocrine Centre's diabetes register. All completed "Skills for Life" Initial Assessments of numeracy and literacy, and the scores were correlated with achieved $HbA_{1C.}$ The subjects' characteristics were compared with those of an audit of the general population with T1D.

3 Literacy was not significantly associated with achieved HbA_{1C} but numeracy was significantly adversely associated with glycaemic control (P=0.027), and this was independent of socio-economic factors.

4 The authors concluded that further investigation into the association between numeracy and glycaemic control is needed but that assessing numeracy skills may be helpful to the structure of education programmes for some patient groups with long-term conditions.

Marden S, Thomas PW, Sheppard ZA et al (2012) Poor numeracy skills are associated with glycaemic control in type 1 diabetes. *Diabet Med* **29**: 662–9

DIABETIC MEDICINE

Insulin pump therapy: Lower hypoglycaemia and seizure rates

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

1 Balancing glycaemic control and hypoglycaemic risk in young people with T1D is challenging. The authors aimed to evaluate the incidence of hypoglycaemic episodes and seizure/coma in children with T1D receiving insulin pump therapy, bolus insulin injections or NPH insulin.

2 A total of 255 young people aged between 9 and 15 years and taking one of the three insulin regimens reported episodes of severe hypoglycaemia for a median of 1.2 years.

3 The overall incidence of severe hypoglycaemia was 37.6/100 patient-years; the value was 31.8, 34.4 and 46.1 per 100 patient-years in insulin pump therapy, bolus insulin and NPH, respectively.The overall incidence of seizure/coma was 9.6/100 patient-years; 4.5, 11.1 and 14.4 per 100 patient-years in insulin pump therapy, bolus insulin and NPH, respectively.

4 The incidence of severe hypoglycaemia and seizures/coma was statistically greater in participants receiving NPH versus those receiving pump therapy (P=0.04 for both comparisons).

5 The authors concluded that there is high incidence of hypoglycaemia in young people with T1D. They found that pump therapy is associated with lower rates of hypoglycaemia and seizure/coma when compared with NPH, and that this should be considered when prescribing.

Katz ML, Volkening LK, Anderson BJ et al (2012) Contemporary rates of severe hypoglycaemia in youth with Type-1 diabetes: variability by insulin regimen. *Diabet Med* 14 Mar [Epub ahead of print]

"Between 1989 and 2007, three trials (BABYDIAB, BABYDIET and DIPP) screened children at medium-to-high genetic risk of T1D for islet autoantibodies."

DIABETES CARE

Diabetes risk score: Early identification of T1D risk

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

1 The pathogenic development of T1D begins well before the onset of diabetes complications. There currently exists no method for identifying people who will almost certainly develop T1D.

2 The study authors assessed the applicability of the Diabetes Prevention Trial-Type 1 Risk Score (DPTRS) for identifying people at risk of developing T1D within 2 years.

3 The DPTRS includes age, log BMI, log fasting glucose and C-peptide oral glucose tolerance test data.

4 The DPTRS was validated using Diabetes Trial-Type 1 (DPT-1) and TrialNet Natural History Study (TNNHS) data. The cumulative incidence of T1D was determined after the thresholds were first exceeded and after the first occurrence of glucose abnormalities.

5 When the DPTRS threshold of 9.00 was exceeded, the 2-year risks estimates for developing T1D were 0.88 (n=90) and 0.77 (n=69) in DPT-1 and TNNHS, respectively.

6 C-peptide stimulated levels were substantially higher when the 9.00 threshold was exceeded well before diagnosis of T1D.

7 The authors concluded that a DPTRS score of 9.00 identifies individuals who are in a preclinical diabetes state and who are therefore very likely to progress to diagnosis of a diagnosis of T1D within 2 years.

Sosenko JM, Skyler JS, Mahon J et al (2012) The application of the Diabetes Prevention Trial-type 1 risk score for identifying a preclinical state of type 1 diabetes. *Diabetes Care* 4 May [Epub ahead of print]

DIABETES TECHNOLOGY AND THERAPEUTICS

SAP reduces glycaemic variability

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

1 Participants (n=495) with well-controlled T1D on multiple daily injections (MDI) of insulin were randomly assigned to optimised insulin sensor-augmented pump (SAP) or MDI therapy for 1 year.

2 Baseline and 1-year HbA_{1c} and CD40 ligand levels, and blinded CGM data were collected.

3 Subjects were stratified into four groups defined by 1-year HbA_{1c} measurements. At HbA_{1c} levels <48 mmol/mol (6.5%), CGM levels were similar in both SAP and MDI groups. The between-group difference for sensor glucose SD and coefficient of variation at HbA_{1c} <64 mmol/mol (8%) was significant (P<0.01 and P=0.01, respectively). MAGE remained similar in the SAP and MDI subjects (P=0.23).

4 The authors concluded that SAP therapy may be beneficial in reducing the number and severity of hypoglycaemic episodes compared with MDI therapy in people with T1D.

Buse JB, Kudva YC, Battelino T et al (2012) Effects of sensor-augmented pump therapy on glycemic variability in well-controlled type 1 diabetes in the STAR 3 Study. *Diabetes Tech Ther* 23 Apr [Epub ahead of print]

DIABETES AND METABOLISM

Metabolic dysfunction linked to physical inactivity

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

1 The authors compared the effect of physical activity and diet on metabolic dysfunction in 19 postmenarchal adolescent girls with T1D with 19 healthy girls.

2 Subjects completed a 4-day dietary diary, and physical activity and quality of life were measured using validated questionnaires. After a 12-hour fast, subjects' metabolic profiles were measured.

3 In the T1D group, fat mass, insulin resistance and displipidaemia indicators were higher, but serum adiponectin was not raised, compared with healthy subjects.

4 The authors concluded that in this cohort metabolic dysfunction is more strongly linked to physical inactivity than to poor diet.

Heyman E, Berthon P, Youssef H (2012) Metabolic dysfunction in late-puberty adolescent girls with type 1 diabetes: relationship to physical activity and dietary intakes. *Diabetes Metab* 18 Apr [Epub ahead of print]

DIABETOLOGIA

Islet autoimmunity screening could aid T1D prevention

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

1 Between 1989 and 2007, three trials (BABYDIAB, BABYDIET and DIPP) screened children at medium-to-high genetic risk of T1D for islet autoantibodies.

2 Data from all three studies indicated an "explosion" of islet autoimmunity between age 6 months and 3 years. BABYDIAB and DIPP data showed that after 5 years of age development of islet autoantibodies and/or diabetes was uncommon.

3 The authors concluded the findings from these trials have important implications for early autoimmunity screening and intervention in T1D prevention.

Wiliams AJ, Bingley PJ (2012) Worth the wait: type 1 diabetes prospective birth cohort studies enter adolescence. *Diabetologia* 20 May [Epub ahead of print]