Management of type 1 diabetes

COCHRANE DATABASE

Sulphonylureas should not be first-line treatment for antibody-positive type 2 diabetes

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

1 This study compared treatments for latent autoimmune diabetes in adults (LADA), which characteristically presents as non-insulin-dependent type 1 diabetes and progresses to insulin dependence.

2 A meta-analysis was conducted on randomised controlled trials evaluating treatment options for LADA or antibody-positive type 2 diabetes.

3 From eight publications, seven studies involving 735 people were included.

4 Insulin plus either rosiglitazone or a sulphonylurea (SU) in addition to insulin did not improve metabolic control significantly more than insulin alone.

5 An SU alone led to equivalent or poorer control than insulin alone. The mean difference in HbA_{1c} was 2.8 % in one study.

6 There was evidence that, compared with conventional treatment, SU therapy led to greater insulin use at 2 years (60 % versus 5 %; $P<0.001$). A greater percentage of people were also classified as being insulin dependent if they used an SU (64 %) compared with insulin (12.5 %; $P=0.007$).

7 In conclusion, SUs should not be used as a first-line treatment for LADA. However, it is important to note that all studies had a high risk of bias. In addition, there was a great deal of variation in the selection of people with LADA, making generalisation difficult.

Brophy S, Brunt H, Davies H et al (2007) Interventions for latent autoimmune diabetes (LADA) in adults. *Cochrane Database Systematic Review* CD006165

Interventions for latent autoimmune diabetes in adults

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It is all too easy to base the diagnosis of diabetes type on age and body weight. To do so will overlook important groups with secondary diabetes, such as from haemachromatosis, but also some people who have type 1 diabetes may be misclassified as type 2. In fact, 13 % of participants aged 25–44 years in the UKPDS were subsequently reclassified as having slow-onset type 1 diabetes on the basis of positive antibodies. All progressed rapidly to requiring insulin (94 % within 6 years). Now known as LADA (latent autoimmune diabetes in adults), the condition is frequently overlooked. Pragmatists will say that such precise classifications are unnecessary at diagnosis since the risk of diabetic ketoacidosis is low and management unchanged. This Cochrane review summarises what is known about the treatment interventions for LADA and indicates how few good-quality studies there are in this group. Early treatment with insulin, while logical, is not proven to preserve ß-cell function.

As the nation gets progressively more obese, differentiating type 1 from type 2 diabetes in younger individuals will be increasingly difficult. Antibody testing can be helpful where there is doubt. This, together with measurement of C-peptide and insulin secretion, may avoid unnecessary weight-inducing insulin therapy in those with type 2 diabetes but, more importantly, in those with LADA. Identifying people who are likely to do less well on oral hypoglycaemic agents (OHA) can be helpful information to give to people as the clinician is not tempted to delay insulin therapy when OHAs start to fail. The more precisely we can classify individual conditions, the more likely we are to be able to tailor the appropriate treatments.

DIABETIC MEDICINE

Severe or nocturnal hypoglycaemia risk is lower with insulin detemir than glargine

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

1 People with type 1 diabetes (n = 320) were administered twice-daily insulin detemir or once-daily insulin glargine in addition to premeal insulin aspart.

2 At 26 weeks follow-up, HbA_{1c} had decreased from 8.8 to 8.2 % with insulin detemir and 8.7 to 8.2 % with insulin glargine.

3 Insulin glargine lowered fasting plasma glucose to 7.0 mmol/l compared with 7.7 mmol/l for insulin detemir ($P<0.001$). However, the overall shape of the nine-point plasma glucose profiles was similar between treatments ($P=0.125$).

4 There was no significant difference, overall, in individual variation in plasma glucose ($P=0.437$), although pre-dinner plasma glucose was lower with insulin detemir than with insulin glargine ($P<0.05$).

5 The overall risk of hypoglycaemia was similar between treatments; however, the risk of severe or nocturnal hypoglycaemia was 72 % with insulin glargine compared with 32 % with insulin detemir ($P<0.05$).

6 There was no significant difference in body weight (0.52 kg for insulin detemir versus 0.96 kg for insulin glargine; $P=0.193$).

7 The two treatments produced similar outcomes regarding glycaemic control, weight gain and hypoglycaemia, but the risk of severe or nocturnal hypoglycaemia was significantly greater with insulin glargine than detemir.

Pieber TR, Treichel HC, Hompesch B et al (2007) Comparison of insulin detemir and insulin glargine in subjects with Type 1 diabetes using intensive insulin therapy. *Diabetic Medicine* **24**: 635–42

'The glucodynamic effects of subcutaneous insulin and oral insulin spray were shown to be similar in people with type 1 diabetes.'

DIABETES TECHNOLOGY & THERAPEUTICS

Oral insulin spray has similar effects to subcutaneous insulin

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

1 In a trial of 10 people with type 1 diabetes using twice-daily insulin glargine, an oral insulin spray was compared with subcutaneous regular insulin to determine the glucose pharmacodynamics with each treatment.

2 For 3 days, preprandial regular insulin was administered, followed by 9 days of oral insulin spray (8–10 puffs immediately pre- and postprandially.

3 Standard snacks or additional insulin were used to adjust to normoglycaemia.

4 At the start and end of the study period, serum concentrations of fructosamine and HbA_{1c} were measured.

5 Average glucose concentrations (mmol/l) for regular insulin versus spray were, respectively, as follows. Pre breakfast: 5.06 and 3.89; 1 hour post breakfast: 8.39 and 7.67; post breakfast: 6.00 and 6.33; pre lunch: 5.50 and 4.72; 1 hour post lunch: 7.83 and 7.89; 2 hours post lunch: 5.89 and 6.33; pre dinner: 5.61 and 5.17, 1 hour post dinner: 7.22 and 7.83; and 2 hours post dinner: 6.11 and 6.67.

6 The areas under the curve were not significantly different between treatments ($P=0.6875$).

7 There were no significant changes in HbA_{1c} (7.5 ± 1.5 % and 7.2 ± 1.2 %) or fructosamine (338.7 ± 77.4 µmol/l and 321.7 ± 63.4 µmol/l).

8 The glucodynamic effects of subcutaneous insulin and oral insulin spray were therefore shown to be similar in people with type 1 diabetes. Appropriate glycaemic control was achievable with intensive monitoring and corrections.

Guevara-Aguirre J, Guevara-Aguirre M, Saavedra J et al (2007) Comparison of oral insulin spray and subcutaneous regular insulin at mealtime in type 1 diabetes. *Diabetes Technology & Therapeutics* **9**: 372–6

DIABETIC MEDICINE

Elevated BMI in prepubescent girls with type 1 diabetes persists into adulthood

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

1 It is common for prepubescent girls with type 1 diabetes to be overweight. This study assessed the change in body composition, in 16 girls with diabetes and 17 controls, from baseline (age 16–19 years) over a 6-year period.

2 At baseline, compared with controls, people with diabetes had a higher BMI (26.4 ± 2.6 versus 23.9 ± 3.7 kg/m^2; $P<0.05$) and fat mass index (10.0 ± 2.4 versus 8.0 ± 2.8 kg/m^2; $P=0.04$).

3 At follow up, people with diabetes still had higher parameters for BMI (27.8 ± 4.9 versus 24.6 ± 5.7 kg/m^2; $P=0.09$) and fat mass index (11.8 ± 5.6 versus 8.7 ± 4.9 kg/m^2; $P=0.05$).

4 BMI at baseline and follow up were correlated for people with diabetes ($r=0.60$; $P<0.05$) and controls ($r=0.83$; $P<0.01$).

5 Overweight in prepubescent girls with type 1 diabetes persists into adulthood and, therefore, preventive measures should be taken to achieve a normal weight during puberty.

Särnblad S, Ingberg CM, Aman J, Schvarcz E (2007) Body composition in young female adults with Type 1 diabetes mellitus. A prospective case-control study. *Diabetic Medicine* **24**: 728–34

PEDIATRIC DIABETES

Better outcomes with intensive treatment during adolescence

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

1 Data from a randomised intervention study of 117 adolescents (45 males and 72 females; mean age: 14.4 ± 2.0 years; mean diabetes duration: 5.7 ± 3.7 years) on intensive treatment for type 1 diabetes were collected over a period of up to 5 years.

2 At 6-month intervals, depressive symptoms, quality of life and metabolic control were monitored.

3 During adolescence, metabolic control is reduced but returns to pre-adolescent levels in early adulthood.

4 Age had no significant effect on the negative impact of diabetes on quality of life, regardless of treatment group or sex.

5 High levels of depressive symptoms in adolescence tended to continue into adulthood, however this did not reach significance ($P=0.066$).

6 In summary, there were relatively few complications in young adulthood and most youths who began intensive treatment as adolescents had good metabolic and psychosocial outcomes as adults.

Insabella G, Grey M, Knafl G, Tamborlane W (2007) The transition to young adulthood in youth with type 1 diabetes on intensive treatment. *Pediatric Diabetes* **8**: 228–34

DIABETES TECHNOLOGY & THERAPEUTICS

Frequent mild nocturnal hypos in children

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

1 Continuous glucose monitoring was used to assess hypoglycaemia incidence in 19 children (mean age: 4.8±1.4 years) during a 6-month period.

2 Mild hypoglycaemia (glucose ≤70 mg/dl) was recorded on 23 % of nights.

3 Mean peak glucose was highest following breakfast (247 ± 64 mg/dl) compared with lunch (199 ± 67 mg/dl) or dinner (194 ± 63 mg/dl).

4 Following 50 % of breakfasts, the rate of glucose increase was ≥2 mg/dl/min. Additionally, children had higher postprandial glucose concentrations when HbA_{1c} ≥8 %.

Gandrud LM, Xing D, Kollman C et al (2007) The Medtronic Minimed Gold continuous glucose monitoring system: an effective means to discover hypo- and hyperglycemia in children under 7 years of age. *Diabetes Technology & Therapeutics* **9**: 307–16