## Time for some definitive studies on the prevention of nephropathy in type 1 diabetes

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Landmark studies such as the Diabetes Control and Complications Trial (DCCT) demonstrated the efficacy of tight glycaemic control on the development and progression of nephropathy (DCCT Research Group, 1993).

Similarly, a study by Lewis and colleagues (1993) of the beneficial effects of captopril in adults with type 1 diabetes and microalbuminuria was subsequently reproduced using other angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (e.g. Chaturvedi et al, 1998). However, the place for these therapies in treating children remains controversial for a number of reasons.

First, tight glycaemic control is difficult to achieve and sustain in this age group (only 6.9% had an $HbA_{1c}$ <7.0% in the Scottish Study Group's DIABAUD2 study [Scottish Study Group for the Care of the Young Diabetic, 2001]). Second, the natural history of microalbuminuria is less certain since the publication of one recent study that showed regression occurring in 58% of patients followed for 6 years (Perkins et al, 2003). Third, use of ACE inhibitors in women of childbearing age carries risks for the developing foetus.

A paper from the Oxford Regional Prospective Study (see right) confirms previous findings in adults that glomerular hyperfiltration is a marker for subsequent microalbuminuria and precedes both this and hypertension. However, there is insufficient evidence to justify therapy for hyperfiltration alone with ACE inhibitors. But rather than wait for these young people to develop microalbuminuria, isn't it time for a randomised controlled trial? What are we waiting for?

Chaturvedi N, Sjolie AK, Stephenson JM et al (1998) Effect of lisinopril on progression of retinopathy in normotensive people with type 1 diabetes. The EUCLID Study Group. EURODIAB Controlled Trial of Lisinopril in Insulin-Dependent Diabetes Mellitus. *Lancet* **351**(9095): 28–31

Diabetes Control and Complications Trial Research Group (1993) The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *New England Journal of Medicine* **329**(14): 977–86

Lewis EJ, Hunsicker LG, Bain RP, Rohde RD (1993) The effect of angiotensin-converting-enzyme inhibition on diabetic nephropathy. The Collaborative Study Group. *New England Journal of Medicine* **329**(20): 1456–62

Perkins BA, Ficociello LH, Silva KH et al (2003) Regression of microalbuminuria in type 1 diabetes. *New England Journal of Medicine* **348**(23): 2285–93

Scottish Study Group for the Care of the Young Diabetic (2001) Factors influencing glycemic control in young people with type 1 diabetes in Scotland: a population-based study (DIABAUD2). *Diabetes Care* **24**(2): 239–44

DIABETES CARE

## Excess mortality seen in young people with type 1 diabetes

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

1 This population-based study linked a childhood diabetes register to the Swedish Cause of Death Register, in order to calculate age- and sex-standardised mortality rate (not including neonatal mortality).

2 To estimate excess mortality, controls matched by age, sex and year of death were used for comparison.

3 The mean age- and sex-standardised mortality rate, relative to controls, was 2.15 (95% confidence interval, 1.70–2.68).

4 The standardised mortality rate was significantly higher in females (2.65) than males (1.93; $P$=0.045).

5 Type 1 diabetes was not significantly associated with death from traffic accidents or suicide.

6 Compared with controls, there was a high proportion of deaths in children with diabetes for which autopsy could not determine a cause.

7 In conclusion, there is excess childhood mortality in those with type 1 diabetes in a country with a well-developed healthcare service.

Dahlquist G, Kallen B (2005) Mortality in childhood-onset type 1 diabetes: a population-based study. *Diabetes Care* **28**(10): 2384–7

KIDNEY INTERNATIONAL

## Early intervention to reduce GFR may be beneficial

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

1 There is a need for more research into changes in urine albumin excretion and development of microalbuminuria with respect to glomerular filtration rate (GFR) and other possible risk factors.

2 As part of the Oxford Regional Prospective Study, this prospective investigation principally examined the link between GFR at 5 years' diabetes duration and yearly urine albumin excretion in children with type 1 diabetes (n=308).

3 The probability of having glomerular hyperfiltration (GFR >125 ml/min/1.73 $m^2$) at 5 years' diabetes duration was linked to poor glycaemic control (a 1% increase in $HbA_{1c}$ equated to a 10% increase in risk) and puberty (puberty onset led to a 1.7-fold increased risk).

4 Furthermore, glomerular hyperfiltration was found to predict microalbuminuria independently of $HbA_{1c}$, suggesting that it could be another factor in early diabetic nephropathy.

5 The authors tentatively suggest that early intervention to reduce GFR may benefit children with poor glycaemic control undergoing puberty who have glomerular hyperfiltration.

6 A second GFR measurement was taken at 10 years' diabetes duration in 102 participants; mean GFR fell by 29.7 ml/min/1.73 $m^2$, but this was accompanied by a significant rise in systolic (by 6.0 mmHg) and diastolic blood pressure (by 5.8 mmHg).

Amin R, Turner C, van Aken S et al (2005) The relationship between microalbuminuria and glomerular filtration rate in young type 1 diabetic subjects: The Oxford Regional Prospective Study. *Kidney International* **68**(4): 1740–9

*'The authors recommend that insulin pumps be removed or turned off during unplanned prolonged exercise to avoid the need to change basal rates.'*

PEDIATRICS

## Study suggests pumps do not need to be on during prolonged exercise

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

1 The aim of the study was to address the lack of clear guidance for children and adolescents on the proper adjustment of insulin pumps during exercise.

2 Participants (n=10) were aged between 10 and 19 years, and the exercise consisted of 40–45 minutes on a cycling machine.

3 Each participant did the period of prolonged exercise on one day with an insulin pump switched on (at 50 % of the basal rate) and on another day with it switched off; the order was chosen randomly.

4 No significant differences were found between having the pump on and having it off for any of the parameters investigated (drop in blood glucose during exercise; cortisol, growth hormone or noradrenaline levels; cardiorespiratory parameters; blood lactate concentrations; free fatty acid levels; and hypoglycaemia during exercise and up to a day afterwards).

5 Given the lack of benefit found in young people with having an insulin pump switched on, the authors recommend that insulin pumps be removed or turned off during unplanned prolonged exercise to avoid the need to change basal rates.

Admon G, Weinstein Y, Falk B et al (2005) Exercise with and without an insulin pump among children and adolescents with type 1 diabetes mellitus. *Pediatrics* **116**(3): e348–55

*'The authors conclude that a system of real-time telemedicine support is feasible and acceptable to people with diabetes.'*

DIABETIC MEDICINE

## Consultation method shows benefit for older adolescents but not younger ones

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

1 This study assessed the effect of a programme of group visits and computer-assisted consultations on glycaemic control and quality of life.

2 Fifty-five adolescents with type 1 diabetes (aged 11–17 years) and their parents entered this programme.

3 The control group received traditional consultations (n=46).

4 Significant age-by-randomisation group interactions across various aspects of quality of life – assessed on a questionnaire completed by 45 people undertaking the programme and 38 controls – implied that the programme was only effective in adolescents aged 14 years or older.

5 The authors suggest that a certain level of emotional and cognitive maturity may be needed to gain benefit from such a programme.

Graue M, Wentzel-Larsen T, Hanestad BR, Sovik O (2005) Evaluation of a programme of group visits and computer-assisted consultations in the treatment of adolescents with Type 1 diabetes. *Diabetic Medicine* **22**(11): 1522–9

DIABETES CARE

## Telemedicine real-time support deemed feasible and acceptable

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

1 This randomised controlled trial was carried out to test real-time telemedicine support for people with type 1 diabetes (T1D).

2 Participants used a blood glucose monitor and a mobile phone to transmit results from self-monitoring of blood glucose to a remote data store.

3 In the intervention group, 47 people with T1D received graphical feedback for the previous 2 weeks on their phone, along with nurse support.

4 In the control group, 46 people with T1D received feedback for the previous 24 hours but no support.

5 After 9 months, the improvement in $HbA_{1c}$ in the intervention group was 0.2 % greater than that in the control group (not significant).

6 The authors conclude that a system of real-time telemedicine support is feasible and acceptable to people with diabetes, but for significant improvements in glycaemic control, changes in diet and exercise as well as real-time support for medication dosing may be needed in addition.

Farmer AJ, Gibson OJ, Dudley C, Bryden K, Hayton PM, Tarassenko L, Neil A (2005) A randomized controlled trial of the effect of real-time telemedicine support on glycemic control in young adults with type 1 diabetes (ISRCTN 46889446). *Diabetes Care* **28**(11): 2697–702

AUTOIMMUNITY

## Four-locus vitamin D receptor haplotype linked to T1D

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

1 Several studies have noted a link between allelic variation of the vitamin D receptor gene and certain autoimmune conditions.

2 Sixty-four Basque families with a history of type 1 diabetes (T1D) – comprising 71 people with the condition and 116 first-degree relatives – were compared with 88 people with no family history of autoimmune conditions.

3 Frequency of haplotype 'fBAt' was significantly associated with T1D.

San-Pedro JI, Bilbao JR, Perez de Nanclares G, Vitoria JC, Martul P, Castano L (2005) Heterogeneity of vitamin D receptor gene association with celiac disease and type 1 diabetes mellitus. *Autoimmunity* **38**(6): 439–44