Management of type 1 diabetes

Diagnosis of cystic fibrosis related diabetes

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The condition of cystic fibrosis (CF) in some ways mirrors that of type 1 and type 2 diabetes. It is a chronic condition for which we do not have a cure managed by a multidisciplinary team in partnership with the individual. The weapons and knowledge available to fight this condition have improved dramatically over the past few years, and the result has been greatly increased survival. Individuals with CF can now reasonably expect to live into their thirties or even beyond.

Hyperglycaemia associated with CF has been considered somehow different to other kinds of diabetes. Raised blood glucose has not been treated aggressively and patients are often not given access to specialist diabetes services. There are a number of reasons for this, but predominantly this has been because people with CF did not live long enough to develop complications relating to hyperglycaemia. This is obviously now changing.

Cystic fibrosis related diabetes (CFRD) is predominantly a disease of impaired insulin secretion, but with a number of other factors that act to alter glucose metabolism. Because of associated gastrointestinal disease, nutrient absorption may be impaired and vary day by day. The condition is often associated with frequent and prolonged periods of sepsis resulting in variable insulin resistance. These problems often combine and result in a chronic catabolic state with other associated metabolic deficits. The final result is glucose tolerance that may vary day by day and with variable contributions of insulin secretion and insulin resistance defects. The end result is a condition we do not know how to diagnose and are not sure how to treat.

The paper by Solomon and colleagues attempts to answer the first of these questions. They conclude that a fasting plasma glucose is inadequate to diagnose CFRD and that a glucose tolerance test is better. People with CFRD may be asymptomatic but almost always have pancreatic exocrine disease. The paper is a step forward but does not answer the question of how variable glucose tolerance is, and what happens during intercurrent illness. Most importantly, perhaps, we do not know the value of insulin therapy in treating the chronic catabolic state associated with this disease. Perhaps, the first step is closer co-operation between cystic fibrosis and diabetes services.

STROKE

Cerebrovascular mortality in type 1 diabetes

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

1 Cerebrovascular mortality rates have been shown to be raised in patients with type II diabetes but have not previously been reported by age and sex in patients with type I diabetes.

2 Age-specific and sex-specific mortality rates and standardised mortality ratios (SMRs) were calculated in 23751 patients with insulin-treated diabetes.

3 Participants had been diagnosed with diabetes under the age of 30 years (between 1972 and 1993), and were followed up for mortality until the end of December 2000.

4 Eighty of a total of 1437 deaths during the follow-up were due to cerebrovascular disease. The overall cerebrovascular mortality rates in the cohort were higher than the corresponding rates in the general population.

5 SMRs were 3.1 (95% CI: 2.2–4.3) for men and 4.4 (3.1–6.0) for women. SMRs were highest in the 20–39 year age group.

6 Cerebrovascular mortality was raised at all ages in these patients.

7 Type I diabetes is at least as great a risk factor for cerebrovascular mortality as type II diabetes.

Laing SP, Swerdlow AJ, Carpenter LM et al (2003) Mortality from cerebrovascular disease in a cohort of 23000 patients with insulin-treated diabetes. *Stroke* **34**: 418–21

THE JOURNAL OF PEDIATRICS

Glucose tolerance screening in patients with CF

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

1 The reported prevalence of cystic fibrosis related diabetes (CFRD) ranges from 4.9-17.3%, and may be increasing. However, the relations among glucose intolerance, genotype, and exocrine pancreatic status in patients with cystic fibrosis (CF) are unclear.

2 The primary hypothesis of this study was that the occurrence of pediatric CFRD correlates with the severity of exocrine pancreatic disease, which in turn is related to the functional classes of CFTR gene mutations.

3 Data was collected on 335 patients from the Toronto CF database. A modified oral glucose tolerance test (OGTT) was given to 94 patients aged between 10 and 18 years of age and without recognised CFDR.

4 CF transmembrane conductance regular mutations and exocrine pancreatic status were determined for all patients.

5 Retrospective analysis of 335 patients with CF gave a prevalence of CFRD of 2.7% (9/355). All the patients with CFRD were pancreatic insufficient.

6 Of the patients given the OGTT, 16 (17%) of 94 had impaired glucose tolerance and 4 (4.3%) had CFRD without fasting hyperglycaemia.

7 Abnormal glucose tolerance was associated exclusively with severe mutations and exocrine pancreatic insufficiency. HbA_{1c} levels did not correspond with glucose tolerance results.

8 Screening of pancreatic-insufficient adolescent patients with CF is recommended as a routine practice.

Solomon MP, Wilson DC, Corey M et al (2003) Glucose intolerance in children with cystic fibrosis. *The Journal of Pediatrics* **142**: 128–32

'These results suggest that screening programmes which target children at puberty are more likely to be efficient'

DIABETES RESEARCH AND CLINICAL PRACTICE

Childhood diabetes is elevated in Taiwan

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

1 There is a large geographical and racial variation in the prevalence of type 1 diabetes. Diabetes is the fifth leading cause of death in Taiwan.

2 In Taiwan, mass urine screening for asymptomatic glucosuria and proteinuria has been conducted in school children since 1992.

3 Approximately 2 615 000 to 2 932 000 students received a preliminary screening each semester.

4 Childhood diabetes of all types was elevated, reaching a peak between sixth and eighth grade. There was a higher prevalence of diabetes in girls than in boys.

5 These results suggest that screening programmes which target children at puberty are more likely to be efficient.

Wei J-N, Chuang L-M, Lin C-C et al (2003) Childhood diabetes identified in mass urine screening program in Taiwan, 1993–1999. *Diabetes Research and Clinical Practice* **59**: 201–06

'Achieving good glycaemic control is difficult for all patients but presents an even greater challenge for pregnant women.'

OBSTETRICS & GYNECOLOGY

Benefits of using continuous glucose monitoring

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

1 Achieving good glycaemic control is difficult for all patients but presents an even greater challenge for pregnant women.

2 This study examined 32 gravid patients at gestational weeks 16–32 with type 1 diabetes, who were being treated with multiple insulin injections.

3 Data derived from the continuous blood glucose monitoring system for 72 h were compared with fingerstick glucose measurements taken 6–8 times per day.

4 The mean total time of hyperglycaemia undetected by the fingerstick method was 192 ± 28 minutes per day.

5 Continuous glucose monitoring can diagnose high postprandial blood glucose levels and nocturnal hypoglycaemia events that are unrecognised by intermittent blood glucose monitoring and may serve as a basis for determining treatment regimens.

6 A large prospective study on maternal and neonatal outcome is needed to assess the clinical implications of this new monitoring technique.

Yogev Y, Chen R, Ben-Haroush A et al (2003) Continuous glucose monitoring for the evaluation of gravid women with type 1 diabetes mellitus *Obstetrics and Gynecology* **101**: 633-38

ARCHIVES OF DISEASE IN CHILDHOOD

Children with asthma may have better glycaemic control

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

1 ß-agonists, together with inhaled steroids, are widely used in the treatment of asthma in children. However, ß-agonists can have a significant effect on blood sugar levels.

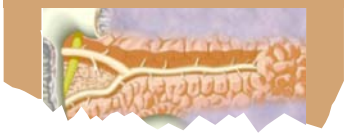
2 The aim of this study was to investigate whether treatment of coexisting asthma has any effect on the incidence of hypoglycaemia and on glycaemic control in children with type 1 diabetes.

3 In this observational study, data on the frequency of hypoglycaemia, treatment for asthma, and HbA_{1c} levels were collected in 226 children (27 of whom had treated asthma) with diabetes.

4 Children with diabetes and treated asthma had significantly fewer episodes of hypoglycaemia and better glycaemic control than children with diabetes alone.

Wright NP, Wales JKH (2003) The incidence of hypoglycaemia in children with type 1 diabetes and treated asthma. *Archives of Disease in Childhood* **88**: 155–56

THE AMERICAN JOURNAL OF GASTROENTEROLOGY



Abnormal mucosal immune response to gluten in type 1

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

1 There is a well-established association between coeliac disease and type 1 diabetes.

2 The aim of this study was to assess the mucosal immune response to gluten in children with type 1 diabetes by rectal gluten challenge.

3 Rectal biopsy samples were taken from 19 children with type 1 diabetes and 16 with coeliac disease before and 6 h after rectal challenge with 2 g of a peptic tryptic digest of gliadin.

4 After a local instillation of gliadin, a significant percentage increment of lamina propria and epithelium $CD3^+$ and of lamina propria and epithelium $\gamma\delta^+$ lymphoctyes was observed in five children with diabetes compared with 11 and 13 children with coeliac disease, and one and two controls, respectively.

5 Discriminant analysis allowed correct classification of 100% of patients with coeliac disease and controls. The same analysis classified four of the 19 children with diabetes in the group of patients with coeliac disease.

6 These findings support the notion that abnormal mucosal immune response to gluten is present in at least a subset of patients with type 1 diabetes.

7 Long-term follow-up is necessary to establish whether these children are at increased risk for developing coeliac disease.

Singhal A, Fewtrell M, Cole TJ, Lucas A (2003) Low nutrient intake and early growth for later insulin resistance in adolescents born preterm. *Lancet* **361**: 1089–97