

325 Early detection of glucose derangement in children with Cystic Fibrosis

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Patients and Methods: 22/83 children <10 yrs with CF (12 Females, mean age 89.4 months, range 29–130) were selected for glucose intolerance on the basis of fasting hyperglycaemia (FH), stress hyperglycaemia (IH) or increased HbA1c. All patients had pancreatic insufficiency and severe genotype. Patients were classified as CF related diabetes (CFRD) with FH/ without FH, impaired glucose tolerance (IGT), normal glucose tolerance (NGT) on the basis of OGTT, according to American Diabetes Association diagnostic criteria. For patients with glucose values >140 mg/dl at any time between T30 and T90 but with normal values at T120 CFRD was confirmed by CGMS (AGT).

Results: 18/22 pts were investigated for increased value of HbA1c, while 4/22 for IH. 12/22 were classified as AGT, 0/22 as IGT, 1/22 as CFRD without FH, 2/22 as CFRD-FH. 7/22 were NGT. The mean value of HbA1c of children with glucose derangement was 6% (range 5.3–7) compared to mean value of 5.7% (range 5.5–6) in NGT. A worse pulmonary status was detected in the first group. 5/15 showed failure to thrive.

Discussion: we report an increased prevalence of glucose intolerance in CF patients <10 years of age, suggesting that OGTT may underestimate this complication in children. CGSM is confirmed to be a more sensitive method of diagnosis in cases with high intermediate glucose levels during OGTT. Furthermore, our data suggest that HbA1c reference range could be revised respect to the age. A strict control of glucose tolerance is recommended early in infancy, especially in presence of risk factors for CFRD such as severe genotype, female sex, exocrine pancreatic insufficiency, increasing number of pulmonary exacerbations and failure to thrive.

327 Re-audit of Cystic Fibrosis inpatient blood glucose monitoring with the unit policy

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Introduction: The UK CF Trust Diabetes Working Group (2004) recommend blood glucose monitoring (BGM) in all inpatients during a respiratory exacerbation (RE) and that patients should be considered for insulin if blood glucose levels are persistently raised.

A previous audit demonstrated inconsistent and suboptimal inpatient BGM in our unit resulting in inadequate assessment and management of glycaemic status during a RE. This led to the development and audit of an inpatient BGM policy/documentation.

Aims: Re-audit CF inpatient BGM using the unit policy/documentation. Highlight those requiring insulin.

Methods: All CF patients admitted with a RE in Nov & Dec 2008 underwent BGM. The policy recommends monitoring for the first 48hrs of admission: pre and 2hrs post breakfast, lunch and evening meal, before bed, pre, 2hrs into and post enteral feed (EF). All patients with persistently raised BG levels >10 mmol/L were assessed for insulin by the Diabetes Nurse (DN). Results were compared with previous audits.

Results: See the table.

Conclusion: Hyperglycaemia was evident during a RE regardless of prior glucose tolerance status. The unit BGM policy has resulted in more effective assessment and management of glycaemic and clinical status.

Mean % frequency of BGM

	Pre meal	Post meal	BB	Pre EF	2hrs into EF	Post EF
Audit 2008	84	46	91	88	75	100
Audit 2007	69	34	47	60	65	35
Pre policy audit 2006	31	12	40	60	70	30

326 Early diagnosis of glucose intolerance and/or diabetes in children with cystic fibrosis

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The aim of our study was to evaluate the prevalence of abnormalities of glucose tolerance in children with CF aged 5 to 19 years, to determine the most useful indexes in early diagnosis of glucose intolerance or diabetes in the preclinical period, to find the risk factors influencing the development of CFRD (Cystic Fibrosis Related Diabetes).

Methods: Children (n=90, mean age 11.7±4.1 years) with CF, not previously diagnosed with diabetes underwent 3-hour oral glucose tolerance testing (OGTT). All subjects with CF were clinically stable.

Result: Abnormal glucose metabolism (AGM) was diagnosed in 14 (15.6%) patients. Diabetes without fasting hyperglycemia (CFRD without FH) was detected in 3 (3.3%) and impaired glucose tolerance (IGT) in 11 (12.2%) children. Two boys with IGT (18.2%) had impaired fasting glucose (IFG). The prevalence of CFRD was 6.6% and IGT 11.2%. The higher glucose area under curve (AUC), early insulin secretion defect and insulin resistance were better associated with clinical status than the conventional glucose tolerance classification based on OGTT. The diagnosis of abnormalities of glucose tolerance was correlated with indexes of glucose metabolism; glycemia during OGTT; Cmax, Tmax and AUC for glucose; peak time of insulin level (Tmax ins); indexes: insulin sensitivity, early and late insulin release.

We conclude that OGTT is a useful investigation in the diagnosis of abnormalities of glucose tolerance in CF. Hyperglycemia may not be the most sensitive index of insulin deficiency in the diagnosis of CFRD.

328 Perks and pitfalls of interstitial glucose monitoring – early experience from an ongoing pilot study

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Background: Oral Glucose Tolerance Testing (OGTT) with subsequent home capillary blood glucose (BG) monitoring does not always reflect true 'real-life' handling of glucose in CF. Continual Glucose Monitoring Studies (CGMS) may have a role in providing a more complete picture.

Objectives: We compared OGTT, determining normal (NGT), impaired (IGT) or diabetic glucose tolerance (DGT) to CGMS.

Methods: 12 adult subjects with stable CF disease had a 3 day home CGMS, recording 4 BG levels daily for calibration. During the 3 day CGMS they attended clinic for OGTT. They also recorded dietary intake, exercise and any relevant symptoms.

Results: 10/12 completed the protocol (2 sensors failed before OGTT), 2/10 were unsuitable for analysis due to lack of calibration data. Within the 2 hour period of the OGTT, blood glucose values and CGMS agreed for NGT(n=3), IGT(n=1) and DGT(n=4). The 4 patients with NGT and IGT had interim glucose excursions into the diabetic range by CGMS during the OGTT. The 3 patients with NGT had CGMS traces showing 'diabetic lifestyles' outwith the OGTT; these highs and lows were often not evident from BG values alone. The patient with IGT had normal continual glucose levels outside this 2 hour test period with their usual diet and daily activities.

Conclusions: OGTT is helpful for categorising people, but there is not a good correlation between this 'snapshot' of glucose handling and true glycaemic control within patients' usual lifestyles. CGMS, however, requires calibration by frequent BG checks, with which several patients had difficulty, and sensor failure may occasionally occur.

More subjects are being recruited to validate CGMS and fully explore glycaemic control in our patients in stable and acute disease.