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Short Communication

The screening and diagnosis of cystic fibrosis-related diabetes in the United Kingdom

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Abstract

Introduction: The cystic fibrosis-related diabetes (CFRD) guidelines produced by the UK CF Trust differ from those used in Europe and the US. We conducted a study to establish current practice.
Method: Paediatric and adult questionnaires were devised and emailed to the 48 specialist UK CF centres.
Results: Completed questionnaires were returned by 39/48 (81%) centres. Only 3/21 (14%) paediatric centres begin annual screening at 12 years (as per UK guidelines), 11/21 (52%) start to screen at 10 years (as per European and US guidelines) and 5/21 (24%) begin screening at a child's first annual review. The oral glucose tolerance test is used as a screening test in 33/39 (85%) of centres but only 3/33 (9%) use it in isolation. Home glucose monitoring is the most frequently used diagnostic test undertaken in 32/39 (82%) centres, and again this is rarely used in isolation. The decision to initiate insulin is often shared between specialist nurses and doctors.
Conclusions: In the UK the majority of CF centres use the OGTT to screen and HGM to diagnose CFRD. The use of other tools varies with poor adherence to UK guidelines. These 2004 guidelines would benefit from being updated to reflect current best evidence.

Keywords: Cystic fibrosis; Cystic fibrosis-related diabetes

1. Introduction

Cystic fibrosis-related diabetes (CFRD) is unusual in children under the age of 10 years. After this age there is an age related increase in the prevalence of CFRD of 5% per year. By the age of 20 years, 24% of CF adults have CFRD [1,2]. It has a major detrimental impact on pulmonary function, nutrition and survival in CF [3–5]. These effects are frequently seen prior to the diagnosis of CFRD being made [6–8]. This highlights the importance of screening to ensure a prompt diagnosis and minimise the 'pre-diabetic' effects. In 2004 the United Kingdom (UK) CF Trust developed guidelines regarding CFRD screening, diagnosis and management [9]. However, these guidelines differ from those used in Europe (2005) and the United States (US) (2010) [10,11]. The differences are summarised in Table 1. We therefore conducted a study to establish current UK clinical practice and determine adherence to the UK CF Trust CFRD guidelines.

2. Methods

Two questionnaires were devised with input from senior CF clinicians, a senior diabetic clinician, a specialist CF nurse and a specialist CFRD nurse. Both collected data on the screening and diagnosis of CFRD, as well as the personnel involved. The first questionnaire was designed specifically for adult CF centres and the second for paediatric CF centres. The relevant questionnaire

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Table 1
Differences between national CFRD guidelines.

	UK CF Trust guideline [9]	European consensus statement [10]	US CFF Clinical Care Guidelines [11]
Annual screening to commence at	12 years	10 years	10 years
Screening tool	OGTT	OGTT	OGTT
Diagnostic tool(s)	OGTT and HGM	OGTT	OGTT & classic symptoms or OGTT & 2nd confirmatory test (FPG, A_1C or 2nd OGTT)
Decision to start treatment	HGM & clinical status	Blood glucose profiles & clinical status	All patients with diagnosis of CFRD

UK: United Kingdom, US: United States, CF: cystic fibrosis, CFF: Cystic Fibrosis Foundation, OGTT: oral glucose tolerance test, HGM: home glucose monitoring, FPG: fasting plasma glucose, and A_1C: glycosylated haemoglobin.

was emailed to the lead consultant at each of the 48 specialist CF centres (24 paediatric and 24 adult). Up to 2 follow-up e-mails were sent if responses were not received.

3. Results

3.1. Response rate

Completed questionnaires were returned by 39/48 centres (81%); 18 adult and 21 paediatric.

3.2. Screening

Only 3/21 (14%) paediatric centres begin annual CFRD screening at 12 years (as per the UK CF Trust guidelines), 11/21 (52%) start at 10 years (as per European and American guidelines) [9–11] and 5 begin at the child's first annual review. See Fig. 1. The most common test used for the annual CFRD screen is the oral glucose tolerance test (OGTT), used in 33/39 (85%) centres. However, this is only used in isolation by 3/33 (9%) centres. Results are usually combined with random plasma glucose (RPG) and/or glycosylated haemoglobin ($HbA1_C$) measurements. Nineteen of 33 centres only measure the blood glucose at 2 h, 13 measure it at 1 and 2 h and one centre measures it at 30, 60, 90 and 120 min. Continuous glucose monitoring systems (CGMSs) are used as the annual screening tool for CFRD in 5/18 (28%) adult centres, but only one centre uses this tool in isolation. Home glucose monitoring (HGM) is used as a screening tool in 4/18 (22%) adult centres. In comparison, only 2/21 (10%) paediatric centres use CGMSs or HGM for CFRD screening. In centres that screen from the first annual review, RBG or $HbA1_C$ is used initially and then when the child is older OGTT or CGMS is used. The majority of adult and paediatric centres undertake additional CFRD screening between annual reviews if the patient has symptoms of hyperglycaemia deterioration in respiratory function, before surgery, during corticosteroid use and prior to starting enteral feeds. This assessment was more likely to be undertaken if the patient was known to have impaired glucose tolerance. Most centres used HGM to undertake this assessment.

3.3. Diagnosis

The test most frequently used to diagnose CFRD is HGM, undertaken by 17/18 (94%) adult centres and 15/21 (71%) paediatric centres. This is usually combined with HbA1C and/or CGMSs. CGMS is undertaken for diagnostic purposes in 23/39 (59%) centres. In paediatric centres, diagnostic tests are more commonly undertaken in isolation. Of the 9 centres, which use HGM alone for CFRD diagnosis, 6 (67%) are paediatric and of the 5 centres, which used CGMSs alone, 4 (80%) are paediatric.

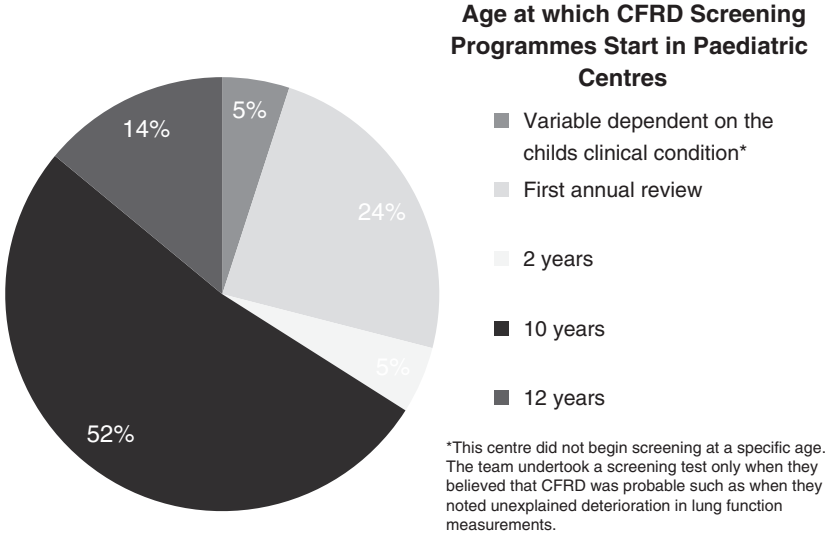

Fig. 1. Percentage of paediatric centres starting CFRD screening programmes at different ages.