Cystic Fibrosis Research News

Title:
Delayed Glucose Peak and Elevated 1-Hour Glucose on the Oral Glucose Tolerance Test Identify Youth with Cystic Fibrosis with Lower Oral Disposition Index

Authors:
Kalie L. Tommerdahl, MD[1,2], John T. Brinton, PhD[1,3], Tim Vigers, BA[2,3], Melanie Cree Green, MD, PhD[1,4], Philip S. Zeitler, MD, PhD[1], Kristen J. Nadeau, MD, MS[1,4], Christine L. Chan, MD[1]

Affiliations:
[1]Department of Pediatrics, Pediatric Endocrinology, Children's Hospital Colorado and University of Colorado Anschutz Medical Campus, Aurora, Colorado, USA
[2]Barbara Davis Center for Diabetes, University of Colorado School of Medicine, Aurora, Colorado, USA
[3]Department of Biostatistics, Colorado School of Public Health, Aurora, Colorado, USA
[4]Center for Women's Health Research, Division of General Internal Medicine, University of Colorado School of Medicine, Aurora, Colorado, USA

What was your research question?
Cystic fibrosis (CF) can lead to high blood sugars from low insulin, an illness called CF-related diabetes (CFRD). CFRD is diagnosed with a blood sugar at the 2-hour time point during an oral glucose tolerance test (OGTT). We tested if other OGTT classifications better identified people with low insulin and high blood sugars.

Why is this important?
Untreated CFRD can cause weight loss and lower lung function and lead to earlier death in people with CF. For these reasons, it is important to know who is at risk for developing high blood sugars and CFRD. Our current criteria using the 2-hour blood sugar on the OGTT may not be the best way to detect who is at early risk for getting CFRD. Therefore, we looked at other ways of using the OGTT to detect early blood sugar and insulin abnormalities.

What did you do?
Youth ages 10-18 years with CF had a 2-hour OGTT. The OGTT was classified as normal or abnormal by traditional criteria based on the 2-hour blood sugar as well as 3 alternate criteria: curve shape (single vs. double curve), time to peak blood sugar, and 1-hour blood sugar. Lung function and weight (body mass index, BMI) were also examined. The oral disposition index (oDI), a way to see if the pancreas is making enough insulin for its current level of insulin

Cystic Fibrosis Research News

sensitivity, was also calculated. We compared oDI, BMI, and lung function in participants grouped by each of the four OGTT classifications as normal or abnormal.

What did you find?

In 52 youth with CF, we found that a late time to achieve peak blood sugar and a 1-hour blood sugar ≥155 mg/dL (≥8.6 mmol/L) better identified people with a lower oDI than the traditional OGTT criteria of a 2-hour blood sugar ≥140 mg/dL (≥7.8 mmol/L). None of the four OGTT classifications identified people with a worse BMI or lung function. The oDI was not associated with BMI or lung function measures.

What does this mean and reasons for caution?

Youth and adults with CF are at high risk for CFRD and early high blood sugars may also place them at risk for complications. Our data support the inclusion of earlier time points on an OGTT, such as every 30-minute blood sugars, in order to detect the time to peak blood sugar. Our data also support including a 1-hour blood sugar on the OGTT to more accurately identify people at risk for progression to CFRD.

What's next?

Future studies are needed to find out whether these other ways of classifying the OGTT better detect people with CF who are at risk of clinical decline. Studies testing whether beginning insulin treatment in the early stages of CFRD can prevent later clinical decline are also needed.

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