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Cystic Fibrosis Research News

Title:

Glycaemic control and FEV_1 recovery during pulmonary exacerbations in paediatric cystic fibrosis-related diabetes

Authors:

William Okoniewski, BS[1,2], Kara S. Hughan, MD[1,3], Gabriel A. Weiner[2], Daniel J. Weiner, MD[1,2], Erick Forno, MD MPH[1,2]

Affiliations:

[1]Department of Pediatrics, University of Pittsburgh School of Medicine;
[2]Division of Pulmonary Medicine and
[3]Division of Endocrinology and Diabetes, UPMC Children's Hospital of Pittsburgh, Pittsburgh, PA.

What was your research question?

The goal of this study was to determine if tighter glycemic control in individuals with CF-related diabetes (CFRD) during a hospitalization for acute worsening of lung infection (pulmonary exacerbations) is associated with better lung function recovery. Our hypothesis was that children with glucose levels closer to the normal range would have better recovery than those with elevated glucose levels.

Why is this important?

Pulmonary disease remains the main CF-related complication. Around a third of individuals with CF experience an acute pulmonary exacerbation each year, and in a quarter of these cases lung function does not fully recover to pre-exacerbation levels. CFRD has been associated with more rapid decline of lung function, but it is unclear if tighter short-term glucose control in the hospital is linked to lung function recovery during acute exacerbations. Identifying factors that predict lung function recovery during an exacerbation could help individuals with CFRD maintain lung function and improve both quality and length of life.

What did you do?

We reviewed the medical records from all individuals with CF ages 6-21 years who were hospitalized for pulmonary exacerbations at our CF Center. Data collected and analysed included lung function, all blood glucose levels drawn while in the hospital, and other important clinical information. Glucose control was analysed using a method called "area

under the curve" that helps accurately reflect glucose levels over time. Our primary measure of interest (outcome) was FEV1 recovery. We evaluated individuals with and without CFRD separately, and also looked at whether treatment was completed in-hospital or at home, as we hypothesized there may be a potential difference due to treatment setting.

What did you find?

We found that individuals with CFRD who finished IV antibiotics at home were treated for longer than those who completed treatment in the hospital. However, in those who finished therapy at home, higher inpatient glucose levels were associated with less lung function recovery –around 20% lower at hospital discharge compared to individuals with good glycemic control. We found similar results at the end of IV antibiotic treatment, and at the next clinic follow-up. We found no associations between long-term glucose control (measured by haemoglobin A1c) and lung function recovery.

What does this mean and reasons for caution?

To our knowledge, this is the first report linking poor glucose levels to lower lung function recovery during hospitalizations in individuals with CFRD who finished IV antibiotics at home. This suggests that better glucose control may help maximize recovery during exacerbations. However, this was a small study in one CF Center and it was an observational retrospective study; therefore, we cannot conclude poor glucose control was the cause of the low improvement in lung function. Also, we found no associations between glucose control and lung function recovery in individuals without CFRD, or in those with CFRD who finished treatment in the hospital.

What's next?

Engage other Centres to evaluate the same questions in their CFRD population. If our findings are confirmed, it may mean that better short-term glucose control is important to help improve lung function recovery during exacerbations in individuals with CFRD. It may also mean that individuals with CFRD and poor inpatient glycemic control should complete their IV antibiotics in the hospital.

Original citation in PubMed

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