

# Cystic Fibrosis Research News

## Title:

Glycemic indices at night measured by CGM are predictive for lower pulmonary function in adults but not in children with cystic fibrosis

## Lay Title:

Increased blood glucose during the night is associated with a lower pulmonary function in adults but not in children with cystic fibrosis.

## Authors:

Dimitri Declercq<sup>abcd</sup>, Simon Helleputte<sup>e</sup>, Sophie Marchand<sup>c</sup>, Sara Van Aken<sup>b</sup>, Eva Van Braeckel<sup>d,g</sup>, Sabine van Daele<sup>a,d</sup>, Guy T'Sjoen<sup>d,f</sup>, Stephanie Van Biervliet<sup>a,d</sup>, Bruno Lapauw<sup>d,f</sup>

## Affiliations:

<sup>a</sup> Cystic Fibrosis Reference Centre, Department of Pediatrics, Ghent University Hospital, Ghent, Belgium.

<sup>b</sup> Department of Pediatrics, Centre for children and adolescents with diabetes, Ghent University Hospital, Ghent, Belgium.

<sup>c</sup> Centre for Nutrition and Dietetics, Ghent University Hospital, Ghent, Belgium.

<sup>d</sup> Department of Internal Medicine and Paediatrics, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium

<sup>e</sup> Department of Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium.

<sup>f</sup> Department of Endocrinology, Ghent University Hospital, Ghent, Belgium.

<sup>g</sup> Cystic Fibrosis Reference Centre, Department of Respiratory Medicine, Ghent University Hospital, Ghent, Belgium.

## What was your research question?

In our paper we wanted to answer two research questions. Firstly, how do glucose levels evolve during the day and night in children and adults with cystic fibrosis (CF) that were not previously diagnosed with diabetes and are not on highly effective CFTR modulators? Secondly, are abnormal glucose patterns in this cohort associated with pulmonary function and nutritional status?

## Why is this important?

Abnormal glucose patterns are very common in people with CF. Even infants can already show abnormal glucose patterns. It is assumed that glucose tolerance worsens as people with CF get

# Cystic Fibrosis Research News

older and eventually 50% of adults with CF are diagnosed with CF related diabetes. The early onset of these abnormalities in the glucose metabolism, despite a normal oral glucose tolerance test are often reported in scientific literature. The association between early abnormalities in the glucose metabolism is not clear. In some studies an association between early abnormalities in the glucose metabolism and pulmonary function and/or nutritional status is reported. Some studies cannot find this association.

## **What did you do?**

We selected children and adults who were not yet diagnosed with diabetes. After an abnormal oral glucose tolerance test (OGTT) and/or abnormal average blood glucose (sugar) levels for the last two to three months (HbA1c%), individuals were referred for continuous glucose monitoring (CGM). We used the Dexcom G4 Platinum sensor (Dexcom, Inc). This device is worn over a period of 7 days. CGM results (variables) give information on the variation of the glucose levels and the duration that glucose levels are between or outside normal ranges (glycemic control). Due to the lack of clearly defined CGM-variables and their thresholds, a wide range of CGM-variables were used to study associations with pulmonary function and nutritional status. A difference was made between children and adults, and diurnal (during the day) and nocturnal (during the night).

## **What did you find?**

We could confirm findings that were previously reported in the literature: some individuals in our cohort had abnormal glycemic profiles on CGM despite a normal OGTT. We did not find any association between CGM-derived variables for glycemic control and pulmonary function or nutritional status in children. We did observe that adults with CF with a lower pulmonary function had higher glucose levels at night. For every % of time the glucose on CGM was greater than 140 mg/dl, this was associated with a 0.76% lower FEV1% (a measure of lung function).

## **What does this mean and reasons for caution?**

These findings suggest that individuals with CF have an increased risk to have an abnormal glucose profile despite a normal OGTT-result. Several CF centers are reporting the use of CGM in conjunction with OGTT. However, more research is needed to find the correct variables to evaluate glycemic control in CF. Glycemic control during the night might reflect subtle alterations in glucose tolerance and thus be a more accurate predictor for worsening pulmonary function or nutritional status, or both. These findings were found in a small cohort and should be interpreted with caution.



# Cystic Fibrosis Research News

## **What's next?**

This research needs to be repeated in another cohort to see if they find the same results. Based on the current results it is interesting to see if lowering the glucose levels during the night might have an effect on pulmonary function.

## **Original manuscript citation in PubMed**

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[cfresearchnews@gmail.com](mailto:cfresearchnews@gmail.com)