

Cystic Fibrosis Research News

Title:

EARLY GLUCOSE ABNORMALITIES ARE ASSOCIATED WITH PULMONARY INFLAMMATION IN YOUNG CHILDREN WITH CYSTIC FIBROSIS

Authors:

Bernadette J. Prentice^{a,b,c}, Chee Y. Ooi^{b,c,d}, Roxanne E. Strachan^{b,c}, Shihab Hameed^{b,c,e}, Saeideh Ebrahimkhani^b, Shafagh A. Waters^{b,c}, Charles F. Verge^{b,c,e}, John Widger^{a,b,c}

Affiliations:

^aDepartment of Respiratory Medicine, Sydney Children's Hospital, Randwick NSW

^bSchool of Women's and Children's Health, Medicine, The University of New South Wales, Randwick NSW

^cMolecular and Integrative Cystic Fibrosis Research Centre (miCF_RC), Sydney Australia

^dDepartment of Gastroenterology, Sydney Children's Hospital, Randwick NSW

^eDepartment of Endocrinology, Sydney Children's Hospital, Randwick NSW

What was your research question?

Due to the fact that other studies have shown that lung function and nutrition begin to decline several years before a diagnosis of Cystic Fibrosis-related diabetes (CFRD) is made, we decided to determine if very young children with Cystic Fibrosis had abnormal glucose levels and if children with high glucose levels had signs of more lung disease.

Why is this important?

Patients with CFRD have more infections, poorer growth and nutrition, lower lung function and can die at a younger age. Also, there is increasing evidence that CFRD actually begins in early life and because it can occur without specific diabetes symptoms, routine annual screening using the glucose tolerance test is now recommended from ten years of age. Approximately 10% of children with CF are diagnosed with CFRD by this age.

What did you do?

We used Continuous Glucose Monitors ("CGM", a small device taped to the body which measures glucose levels just under the skin for three days at home) to look at the pattern of glucose in children with CF less than 6 years of age. The children having the CGM also had a bronchoscopy (a telescope test looking at and sampling the airways under anaesthetic) which tested for infection and markers of inflammation or early lung disease.



Cystic Fibrosis Research News

What did you find?

Our study showed that children with CF less than 6 years of age did have high glucose levels on CGM. Some of these young children had high glucose levels that went into the range of diabetes. The children with high glucose levels also had a higher level of neutrophils (one of the airway cells which cause lung damage) and IL-8 (a protein released from the neutrophil). These children were also more likely to have previously grown *Pseudomonas aeruginosa* on bronchoscopy test or on throat swab.

What does this mean and reasons for caution?

This research suggests that children with CF may have high glucose levels from a very early age. This increase in glucose appears to be related to infection and inflammation of the airways. We do not know whether glucose levels in this age group identified this way is leading to poorer lung function or permanent lung damage, and we do not know if treatment with insulin or CFTR modulators (eg ivacaftor) can correct these glucose abnormalities.

What's next?

The next step in our research is to study the effects of CFTR modulators on CGM glucose levels and see if these new treatments can prevent glucose abnormalities in young children with CF, and eventually to see if we can prevent CFRD from developing.

Original manuscript citation in PubMed

<https://www.ncbi.nlm.nih.gov/pubmed/31036487>