European Cystic Fibrosis Society

Journal of Cystic Fibrosis
The Official Journal of the European Cystic Fibrosis Society

Cystic Fibrosis Research News

Title:

The main mechanism associated with progression of glucose intolerance in older patients with cystic fibrosis is insulin resistance and not reduced insulin secretion capacity.

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What was your research question?

Aging people with cystic fibrosis (CF) are at high risk of developing elevated blood sugar, which can lead to CF-related diabetes (CFRD). A decrease in insulin (the key hormone that regulates blood sugar) secretion over time is the main mechanism hypothesis to explain this risk in children, teenagers and/or young adult. In this study, we investigated potential mechanisms to explain the high risk of developing elevated blood sugar in older people.

Why is this important?

After pulmonary complications, CFRD is now the most frequent secondary complication of CF. CFRD is present in 10% of children and increases up to 40-50% in adults aged 35 years old. In CF the pancreas (organ important for digestion and insulin production) is damaged by thick mucus. As a reduction in insulin production is believed to be the main mechanism of high blood sugar, when CFRD occurs, the only recommended treatment in CFRD is insulin injections.

What did you do?

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We followed 46 older CF patients (age > 35 years) for around a decade to assess the evolution of blood sugar and insulin secretion. Furthermore, we monitored insulin's ability to signal movement of sugar from the blood into tissues (i.e. insulins actions) over time. We also collected weight and lung function from the participants.

What did you find?

We found that indeed, people with CF over 35 years present reduced insulin secretion, but there was no further deterioration of the insulin secretion over the 10-year follow-up period despite a worse blood sugar evolution. More patients had increased blood sugar over time, and this was mostly related to a reduced insulin action in tissues. In addition, contrary to what is frequently observed in younger people, CFRD onset was not associated with an increased risk of losing more weight or lung function than what could have been predicted by the patient medical history.

What does this mean and reasons for caution?

Our observation of CFRD onset in an older population suggest a different mechanism for developing elevated blood sugar (reduced insulin action in tissues) that previously thought (reduced insulin secretion) and is not associated with adverse weight and lung outcomes. Though, our observation is limited to a Canadian based population relatively homogenous and healthy. Confirmation of our data in other population will thus be important.

What's next?

If other studies confirm our observation, it will be important to test therapeutic options to improve insulin action in tissues on blood sugar and also weight and lung function. To improve insulin action lifestyle options (exercise, diet quality) as well as some medications are available.

Original manuscript citation in PubMed

https://www.ncbi.nlm.nih.gov/pubmed/?term=The+main+mechanism+associated+with+progression+of+glucose+intolerance+in+older+patients+with+cystic+fibrosis+is+insulin+resistance+and+not+reduced+insulin+secretion+capacity.

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