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Cystic Fibrosis Research News

Title:

Association between glucose intolerance and bacterial colonisation in an adult population with cystic fibrosis, emergence of *Stenotrophomonas maltophilia*.

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What was your research question?

Cystic fibrosis related diabetes (CFRD) is common in cystic fibrosis (CF). The primary concern is that when blood glucose (sugar) levels are high, glucose is detected in the lungs. High glucose values are often frequent in CFRD and can increase the risk of bacterial colonisation and infections. Our objective was to study the link between glucose and lung bacteria emergence.

Why is this important?

The most common secondary complication in CF is CFRD. Despite significant therapeutic improvements, CFRD still increases the risk of decline in both nutritional and pulmonary status. In some patients, despite regular treatment, bacterial colonisation expands significantly and generates pulmonary infections. High glucose could favour the development of some bacteria. As high blood glucose values are frequent in CFRD, it becomes important to evaluate the association between these high levels and bacterial growth.

What did you do?

We explored and identified a multitude of microorganisms in the lungs of 260 adults with CF between 2004 and 2015. We then categorized these patients based on their glucose tolerance status (normal, prediabetic and diabetic) and then compared their nutritional status,

their pulmonary function as well as the frequency of lung exacerbations between each group. We also explored the effect of the evolution of glucose tolerance on bacterial colonisation after three years.

What did you find?

Stenotrophomonas maltophilia (*S. maltophilia*) was the sole bacteria highly colonized in prediabetic and diabetic patients. Individuals with both *S. maltophilia* colonization and a prediabetic or diabetic status are at higher risk of having low lung function. However, we were unable to find evidence of a direct relationship between the presence of *S. maltophilia* colonization and glucose tolerance. The two states appear to coexist rather than have a direct relationship. We propose that *S. maltophilia* is a marker of disease severity in CF.

What does this mean and reasons for caution?

Since *S. maltophilia* was more present in patients with prediabetes and diabetes but was not affected by the evolution of glucose tolerance status, we believe that the presence of this bacteria potentially indicates a more severe disease state in this population. Further work should compare patients who are chronically infected with this bacteria with those who have only been infected once. Furthermore, glucose levels in the lungs were not assessed in this study, this could be of interest in the future.

What's next?

S. maltophilia emergence is increased in CF so it remains important to study this bacteria in more depth to better understand its role, and the risk factors favouring its presence and its effect on lung health.

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