

Cystic Fibrosis Research News

Title:

FECAL PROTEOMICS: A TOOL TO INVESTIGATE DYSBIOSIS AND INFLAMMATION IN PATIENTS WITH CYSTIC FIBROSIS

Authors:

Griet Debyser^a, Bart Mesuere^b, Lieven Clement^b, Jens Van de Weygaert^b, Pieter Van Hecke^a, Gwen Duytschaever^a, Maarten Aerts^a, Peter Dawyndt^b, Kris De Boeck^c, Peter Vandamme^a, Bart Devreese^a

Affiliations:

^aGhent University, Department of Biochemistry and Microbiology, K.L. Ledeganckstraat 35, B-9000 Ghent, Belgium

^bGhent University, Department of Applied Mathematics, Computer Science and Statistics, Krijgslaan 281, B-9000 Ghent, Belgium

^cUniversity Hospital of Leuven, Department of Paediatrics, Gasthuisberg Herestraat 49, B-3000 Leuven, Belgium

What was your research question?

Our gut contains millions of 'good' intestinal bacteria that release vitamins and other health-promoting compounds. In people with cystic fibrosis (CF), the gut bacterial composition is changed, a phenomenon called 'dysbiosis'. Many factors are likely responsible for this such as: altered gut motility, altered mucus, pancreatic insufficiency, regular antibiotic intake... We studied whether this dysbiosis is associated with changes in the health or function of the gut in people with CF.

Why is this important?

Understanding which beneficial bacteria are lacking in the gut of people with CF and how this affects the function of the gut could help in designing strategies to improve gastrointestinal symptoms, for example the use of probiotics.

Cystic Fibrosis Research News

What did you do?

Like most organisms, bacteria make proteins. In the stool ('faeces') we can therefore detect proteins made by bacteria as well as proteins made by the cells of the person themselves. We thus compared the protein content in faeces from people with CF with that of their healthy siblings. We used advanced protein analysis techniques (mass spectrometric technologies) and innovative bioinformatics and statistical approaches to analyse the data.

What did you find?

The faeces from people with CF contain many proteins that reflect gut inflammation. Additionally, we observed a severe reduction in the bacteria that are known to produce butyrate, an important food source to keep intestinal cells healthy, and also known to have anti-inflammatory properties. Compared to healthy people, the faeces of people with CF contain more proteins from bacteria that are associated with infection ('bad bacteria').

What does this mean and reasons for caution?

Even though the patients analysed all received digestive enzyme replacement therapy, the analysis of stools from patients with CF, showed us that there are clear signs of gut inflammation. This might contribute to poor nutrition.

What's next?

By analysing the faeces of CF patients collected over a longer period of time, we wish to investigate whether this shift in the gut bacteria and the consequent inflammation is linked to the condition of CF itself or due to antibiotic treatment.

Original manuscript citation in Pubmed

<http://www.ncbi.nlm.nih.gov/pubmed/?term=FECAL+PROTEOMICS%3A+A+TOOL+TO+INVESTIGATE+DYSBIOSIS+AND+INFLAMMATION+IN+PATIENTS+WITH+CYSTIC+FIBROSIS>