

Cystic Fibrosis Research News

Title:

Modulation, microbiota and inflammation in the adult CF gut: a prospective study

Lay Title:

ivacaftor does not change gut bacteria, inflammation or pancreas function

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What was your research question?

We already know that ivacaftor improves lung function, weight and number of exacerbations. We asked does starting ivacaftor change the bugs that grow in the gut of people with CF (gut microbiota). We also asked does it change markers of gut inflammation (faecal calprotectin, lactoferrin). Lastly, we asked does ivacaftor results in improvements in how well the pancreas works by measuring faecal elastase in stool samples.

Why is this important?

People with CF often have gut symptoms. Many factors may play a role in this including changes in gut bacteria, inflammation, courses of antibiotics. The human gut has a large number of bacteria (microbiota). Changes have been shown in the gut bacteria of people with CF. Studies have also shown increased levels of inflammation in the gut of people with CF by measuring stool markers of inflammation. We wanted to get a better understanding of what happens in the CF gut after starting ivacaftor. For the majority of people with CF the pancreas does not work at 100% and they need to take creon. We can see how well the pancreas works

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by measuring stool faecal elastase. The KIWI study showed ivacaftor improved pancreas function in young children with CF. We wanted to see if this would be the same in adults.

What did you do?

We collected stool samples from patients with CF before starting ivacaftor and after treatment when they were coming to clinic for up to a year after starting ivacaftor. The different gut bacteria were measured both the numbers and different types of bacteria. They were then compared before and after ivacaftor to see if this changed. We also measured stool faecal elastase and markers of gut inflammation before and after ivacaftor.

What did you find?

We saw significant improvements in lung function, weight and reduction in number of antibiotics after ivacaftor as one would expect. There was no significant change in how well the pancreas worked after ivacaftor and faecal elastase remained very low. There was no significant change in markers of gut inflammation after starting ivacaftor. There was a small increase in some gut bugs associated with better gut health and a reduction in those associated with a less healthy gut. But this was not significantly different after ivacaftor compared to before. Overall, there was no significant change in the gut bacteria after ivacaftor.

What does this mean and reasons for caution?

This suggests the ability of the pancreas to make enzymes after ivacaftor is not improved in adults who start ivacaftor. But this study was of short duration and so this might be different with longer treatment. There was no significant change in markers of gut inflammation after ivacaftor in adults treated with ivacaftor. This suggests that the increased inflammation in the gut of people with CF may be due to a combination of additional reasons. There was a slight change towards a healthier gut profile of bacteria after ivacaftor. However, this was not statistically significant. Overall, this was a small sample size – 14 people – and so it may not have had large enough numbers of people taking part to show a significant change. All the people who participated in the study were adults and so this might be different in children who start ivacaftor earlier in life.

What's next?

In children who started ivacaftor earlier in life it may be that there will be improvements in faecal elastase, gut inflammation and microbiota. It may be that a longer period of time of follow up will be required to see changes in the CF gut after starting ivacaftor.



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