



Cystic Fibrosis Research News

Title:

Airway bacterial community composition in persons with advanced cystic fibrosis lung disease

Lay Title:

Lung infection in people with advanced cystic fibrosis lung disease

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What was your research question?

What types (species) of bacteria most often make up the community of bacteria present in the airways of people with advanced CF lung disease? How are these communities structured (i.e., in what proportion are different species found)? How does bacterial community structure relate to lung disease?

Why is this important?

A better understanding of how airway infection evolves over time – i.e., how bacterial community structures change from childhood to adulthood – and how this might impact the progression of lung disease may provide opportunities to develop new treatment strategies.

What did you do?

We identified the bacteria present in airway samples from 190 people with advanced CF lung disease. For each, we also determined the relative proportions of the different species found. This allowed us to identify people in whom a single species dominated the bacterial community (i.e., a species that was present in a much higher proportion than other species in the community). We then looked for correlations between bacterial community structure and the degree of lung disease.

What did you find?

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We found that 60% of the people we studied had an airway bacterial community that was dominated by a single species. Compared to this group, lung disease was not as severe in the remaining 40%.

What does this mean and reasons for caution?

As people with CF age and lung disease progresses, the structure of the bacterial communities that infect the airways change. Most often, a single species of bacteria – among the several that are usually present – begins to dominate the community, increasing in proportion to other community members. This restructuring of airway bacterial communities is associated with worse lung health. Why and how this occurs is not known.

What's next?

We would like to understand what factors account for this change. A better understanding of how airway infection changes as persons age and lung disease progresses may offer opportunities to imagine new ways of treating lung infection in CF.

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