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Cystic Fibrosis Research News

Title:

COMPARING ENCOUNTER-BASED AND ANNUALIZED CHRONIC PSEUDOMONAS INFECTION DEFINITIONS IN CYSTIC FIBROSIS

Lay Title:
COMPARING FOUR DIFFERENT DEFINITIONS OF CHRONIC PSEUDOMONAS INFECTION IN PEOPLE WITH CYSTIC FIBROSIS

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What was your research question?

Pseudomonas is a bacteria that can infect the lungs of people with CF and cause chronic (long-term) infection. How do different definitions of chronic Pseudomonas infection affect

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Pseudomonas infection outcomes in people with CF? We compared the proportion of people with chronic Pseudomonas, the age at chronic Pseudomonas, and the proportion who have sustained Pseudomonas infection based on four different definitions.

Why is this important?

There is no gold standard definition of chronic Pseudomonas infection in people with CF. In addition, some chronic Pseudomonas definitions require only annual data on culture results, while other definitions require culture data every 3 months (encounter-based data). The results of our study informed our ability to do research on Pseudomonas infection from broad eras of care, and in populations of people with CF with different frequencies of available culture data.

What did you do?

The Cystic Fibrosis Genome Project includes approximately 5000 people with CF in the U.S. CF Patient Registry from different eras**.** First, we tested if chronic Pseudomonas definitions using annual culture data over 3-4 years would provide comparable measures of infection to encounter-based definitions using data over 1-2 years. Second, we tested if a new definition of 1 or more positive cultures for Pseudomonas in at least 3 of 4 consecutive years (Green 3/4) identified a greater proportion of people with sustained Pseudomonas infection compared to a published definition using 1 or more positive cultures in at least 2 of 3 consecutive years (Green 2/3).

What did you find?

We found that the new Green 3/4 definition resulted in a similar proportion of people with chronic Pseudomonas, a similar age at chronic Pseudomonas, and a similar proportion of people with sustained Pseudomonas infection compared to two established encounter-based definitions (Emond, Mayer-Hamblett). Annual-based chronic Pseudomonas definitions such as Green 3/4 will be valuable for long-term analyses in groups with limited culture frequency.

What does this mean and reasons for caution?

The Green 3/4 definition appears to be the most robust definition using annual data to evaluate chronic Pseudomonas infection. Definitions of chronic Pseudomonas using annual data will be more relevant in the era of highly effective modulator therapies such as elexacaftor/tezacaftor/ivacaftor with likely less frequent culture data. Reasons for caution include: 1) the culture data used included both sputum (mucus coughed up from the lungs) and throat swabs (the latter could misclassify Pseudomonas infection as being in the lungs

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when that is not true), and 2) comparing these definitions using additional clinical outcomes beyond sustained infection in people with CF (e.g., lung function, exacerbations/flare ups) may result in different findings.

What's next?

Study how the age at meeting different definitions of chronic Pseudomonas infection impacts lung function over time in people with CF. Test genes that modify age of chronic Pseudomonas infection using the Green 3/4 definition and encounter-based definitions, after accounting for risk factors such as pancreatic insufficiency and year of birth.

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