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Cystic Fibrosis Research News

Title:

Risk factors for persistent *Aspergillus* respiratory isolation in cystic fibrosis

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What was your research question?

Our study aimed to describe the number of cystic fibrosis (CF) patients who develop *Aspergillus* in their lungs and determine the factors that put individuals with CF at greater risk for repeatedly growing *Aspergillus* in their sputum cultures or what we describe as "persistent *Aspergillus* isolation."

Why is this important?

Within the past two decades, the number of CF patients with a sputum culture positive for a fungus called *Aspergillus* has increased. The exact reasons why are unknown, but some believe that patient factors, like their age, lung function, or certain medications, may be contributing. We know that bacteria, like *Pseudomonas aeruginosa*, and allergic bronchopulmonary aspergillosis (ABPA) can lead to worse CF lung health; however, the effects of fungi, like *Aspergillus* (without ABPA), on clinical situations that negatively impact CF lives, such as pulmonary exacerbations (or the need for intravenous [IV] antibiotics) and drops in lung function, are not well-understood.

What did you do?

We used the Cystic Fibrosis Foundation patient registry, which includes the data of nearly all of the CF children, men, and women in the United States, and looked at the people (age 6-45

years) in the registry who did not have a history of an organ transplant from 2006 to 2012. We used a statistical model called multivariable logistic regression with generalized estimating equations to determine the characteristics that were associated with "persistent *Aspergillus* isolation" or repeated occasions of *Aspergillus*-positive sputum samples.

What did you find?

We found that almost 10% of people with CF had persistent *Aspergillus* isolation in the registry. We found that the following factors placed people at higher risk for growing *Aspergillus* in their sputum culture: (1) Caucasian race, (2) pancreatic insufficiency, (3) inhaled antibiotics, (4) azithromycin, and (5) inhaled steroids. Other factors, like age and lung function, were not associated with persistent *Aspergillus* isolation.

What does this mean and reasons for caution?

Our results show that *Aspergillus* is commonly seen in the lungs of CF patients. Our findings may represent that sicker CF patients develop *Aspergillus*, but can also suggest that some chronic medications, such as inhaled antibiotics, azithromycin, and inhaled steroids, may allow fungi like *Aspergillus* to grow more easily. These findings do not mean that chronic use of inhaled antibiotics, like tobramycin and aztreonam, and azithromycin are bad for CF (in fact, we know these are very good medications). However, this may suggest that these medications can affect the bugs that grow in the lungs.

What's next?

We need to study these relationships more, because treatments like inhaled antibiotics, azithromycin, and inhaled steroids have helped individuals with CF feel well and remain healthy. More importantly, we need to determine if fungi, including *Aspergillus* (without ABPA), independently cause CF patients to feel worse, have lower lung function, or require more IV antibiotics.

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