Cystic Fibrosis Research News

Title:

Respiratory Pathogens Mediate the Association between Lung Function and Temperature in Cystic Fibrosis

Authors:

Joseph M. Collaco, MD, MPH, Karen S. Raraigh, MGC, Lawrence J. Appel, MD, MPH, and Garry R. Cutting, MD

Affiliations:

The Johns Hopkins Medical Institutions, Baltimore, MD

What was your research question?

We previously found that living in warmer climates was associated with lower lung function (FEV1) for people with cystic fibrosis (CF) in the United States and Australia. In this study we wanted to determine whether respiratory infectious organisms were responsible for this.

Why is this important?

Family based studies have suggested that 50% of the variation in lung function in CF is due to genetic factors and the other 50% is due to environmental factors. Identifying environmental factors that improve or worsen lung disease is important in improving outcomes and our understanding of CF.

What did you do?

We compared lung function and the presence of respiratory infection of people with CF to the ambient temperature where they lived in the continental United States. Ambient temperature was estimated using climate data from 1980-2010. We used two sets of data to double-check our results, from the CF Twin-Sibling Study and U.S. CF Foundation Data Registry.

What did you find?

We found that several respiratory infectious bacteria in CF (Pseudomonas aeruginosa, mucoid Pseudomonas aeruginosa, and methicillin-resistant Staphylococcus aureus [MRSA]) were more commonly found in respiratory cultures for people living in warmer climates, and this may partially explain the lower lung function observed amongst people with CF who live in warmer climates.

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What does this mean and reasons for caution?

Our results imply that where individuals live may affect outcomes, but it is not clear why these bacteria are more commonly found on respiratory cultures in warmer climates. This may reflect more of these bacteria being present in the environment of warmer climates, different medical practices between warm and cold climates, or other environmental factors. We would caution against assuming that colder climates will improve lung function for people with CF, as there are many other factors that impact lung function with stronger effects. For example, second-hand tobacco smoke and adherence to medications.

What's next?

We plan to examine whether climate has more of an effect on lung function at specific ages and whether any genetic factors play a role in how individual lung function responds to climate.

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