European Cystic Fibrosis Society

Journal of Cystic Fibrosis
The Official Journal of the European Cystic Fibrosis Society

Cystic Fibrosis Research News

Title:
Pseudomonas aeruginosa antimicrobial susceptibility test (AST) results and pulmonary exacerbation treatment responses in cystic fibrosis

Authors:
Donald R. VanDevanter,[1] Sonya L. Heltshe,[2] Jay B. Hilliard,[1,3] Michael W. Konstan[1,3]

Affiliations:
1-Department of Pediatrics, Case Western Reserve University School of Medicine, Cleveland OH, USA
2-CFF Therapeutics Development Network Coordinating Center, Seattle Children's Research Institute, Seattle, WA and Department of Pediatrics, University of Washington School of Medicine, Seattle, WA, USA
3-Department of Pediatrics, Rainbow Babies and Children's Hospital, Cleveland OH, USA

What was your research question?
We wanted to know if people with CF and the bacterium Pseudomonas who were having a pulmonary exacerbation (flare up of symptoms) responded better when they were treated with antibiotics that had been shown to inhibit the growth of their bacteria in the laboratory than if treated with antibiotics that did not.

Why is this important?
Pulmonary exacerbations are commonly treated with antibiotics, and the choice of which antibiotic is often guided by the results of laboratory tests where samples of bacteria collected from a patient's lungs are treated with different antibiotics. Bacteria are considered "susceptible" to antibiotics that inhibit their growth in the laboratory. Although many clinicians believe that AST helps to choose the best antibiotic treatments, this has never been proven, and these laboratory tests are both expensive and time consuming. There can be times when laboratory test results might lead a doctor to use a more toxic or expensive antibiotic treatment.

What did you do?
We looked at how well people with CF and Pseudomonas recovered their lung function and weight after treatment with antibiotics for pulmonary exacerbation. We also looked at how soon they had to be treated again for another pulmonary exacerbation. We compared recovery from exacerbations when people were treated with antibiotics to which their

Cystic Fibrosis Research News

Pseudomonas was susceptible to recovery when people were treated with antibiotics to which their Pseudomonas was only partly or not susceptible. We studied more than 3800 pulmonary exacerbations that occurred in over 400 people followed at our CF Care Center over a 20-year period.

What did you find?

Pseudomonas was susceptible to antibiotic treatment in almost two-thirds of exacerbations, but in more than 10% of exacerbations, Pseudomonas was not susceptible to antibiotic treatment. For the other exacerbations (26%), the antibiotics used had not been tested in the laboratory. When we compared the average change in lung function and weight from when people were healthy before the exacerbation to after antibiotic treatment was over, we did not find any difference between those exacerbations in which Pseudomonas was susceptible in the laboratory and those exacerbations where it was not. There was also no difference in the time to when a next exacerbation was treated with antibiotics.

What does this mean and reasons for caution?

Our results suggest that laboratory tests of antibiotic effects on Pseudomonas do not predict how well people will respond to antibiotic treatments of their pulmonary exacerbations. Since these tests are expensive and time-consuming, the CF community may want to reconsider how often these tests are ordered, and whether it is always a good idea to choose antibiotics based on these tests. This study was only conducted in one CF Care Center, and so our results might not be the same if all Care Centers could be included in the analyses.

What's next?

It would be good if other CF Care Centers could conduct similar analyses to confirm what we have seen. Unfortunately, most people with CF are not followed in Care Centers that store antibiotic laboratory tests in a database that can be linked to electronic patient records.

Original manuscript citation in PubMed

https://pubmed.ncbi.nlm.nih.gov/32505525/

cfresearchnews@gmail.com