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Cystic Fibrosis Research News

Title:

OPTIMISING BETA-LACTAM PHARMACODYNAMICS AGAINST *PSEUDOMONAS AERUGINOSA* IN ADULT CYSTIC FIBROSIS PATIENTS

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What was your research question?

Are the best dosing schedules (length of time a drug is administered) being used for the most common antibiotics in the treatment of serious lung infections in adult cystic fibrosis (CF) patients to provide the best outcomes?

Why is this important?

The most common and serious bacterial infection in CF patients is a lung infection due to a bacteria called *Pseudomonas aeruginosa*. This bacteria is extremely hard to treat in normal patients because of bacterial resistance. However CF patients have multiple reoccurring infections with this bacteria that becomes even more resistant to the antibiotics. With the extremely limited number of antibiotics available to treat infections due to this bacteria, can we administer the currently available antibiotics in a different way to overcome the resistance.

What did you do?

Using our CF patients data on the types of bacteria in their lungs to determine the effectiveness of commonly used antibiotics used to treat this bacteria (e.g., *Pseudomonas aeruginosa*) as well as published literature on the differences in the way these drugs behave in the bodies of CF, we modelled different ways of administering these antibiotics to evaluate whether or not optimal dosing was occurring.

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What did you find?

First, the current dosing schedules (giving the antibiotic over 30 minutes) utilized for the most common antibiotics are not adequate for the majority of patients. Second, giving the same dosing schedule but over 3 hours or as a continuous infusion significantly improves patient outcomes. However this dosing schedule did not provide a positive outcome for the set goal of 90% of the patients.

What does this mean and reasons for caution?

Adult cystic fibrosis patients that have an infection with resistant bacteria (*Pseudomonas aeruginosa*), may require antibiotic regimens extremely different from other patients. In fact, giving a dose of the antibiotic over a long time period instead of the standard dose as a bolus infusion should make a significant impact on clinical outcomes. These data are based on knowledge and literature of how to best treat this type of bacterial infection. However, the clinical outcomes in patients utilizing this information is still needed to confirm the results.

What's next?

Further investigations using the dosing outlined in this study should be evaluated in cystic fibrosis patients to determine if these new treatment strategies provide an improvement in clinical outcomes. In addition as new antimicrobials are approved, an evaluation of the best dosing regimen as performed in this study should be performed.

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