Cystic Fibrosis Research News

Title:
Neutrophil Dysfunction in Cystic Fibrosis

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What was your research question?
Using new advanced imaging technologies, we sought to better characterize the function of neutrophils (a type of white blood cell responsible for the immune systems response to infection) from individuals with CF as compared to individuals without CF.

Why is this important?
White blood cells, called neutrophils, are found in high numbers in the airways of individuals with CF. Although neutrophils are helpful in the fight against infection, too many arriving in the airways can cause lung damage. Anti-inflammatory therapies are one way of reducing airway neutrophils to protect CF lungs, however, we need to better understand CF neutrophil behaviour in order to better design anti-inflammatory therapies for individuals with CF.

What did you do?
We compared neutrophils from individuals with CF during an exacerbation and during a routine visit with neutrophils from individuals without CF. We used advanced imaging technologies to study neutrophil movement and response to infection.

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What did you find?

We found that neutrophils from individuals with CF move faster towards infectious signals and tend to form larger clusters or clumps at the place of infection. However, CF neutrophils are less effective at containing and/or killing the infection.

What does this mean and reasons for caution?

This study shows that neutrophils from individuals with CF behave differently than neutrophils from individuals without CF. The differences we identified may help explain the impairment in clearance of infection within the airway of individuals with CF and contributes to the work of other investigators that have also reported altered behaviours of CF neutrophils.

What's next?

We plan to use these new imaging technologies to study neutrophils from specific groups of individuals: those who are on CFTR modulators, those who have undergone lung transplant, and children with CF. This will help us better understand why neutrophils from individuals with CF are altered and how this may impact lung disease in people with CF. This knowledge will be useful for developing therapies that help correct CF neutrophil function and possibly alleviate lung damage.

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