European Cystic Fibrosis Society

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

Cystic Fibrosis Research News

Title:

IL-22 exacerbates weight loss in a murine model of chronic pulmonary *Pseudomonas aeruginosa* infection

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What was your research question?

We asked what role interleukin-22 (IL-22), a type of signal used by the immune system, has in people with cystic fibrosis (CF) infected with the bacteria *Pseudomonas aeruginosa*.

Why is this important?

Pseudomonas aeruginosa infection is common in individuals with CF and often results in chronic (long-term) lung infections. There are no current treatments that reliably prevent or clear this infection. The immune response acting against Pseudomonas is incompletely understood but may help prevent or clear the bacteria. IL-22 protects against a number of lung infections, but its role against Pseudomonas respiratory infection was unknown. IL-22 also helps repair lung tissue damage. Therefore, IL-22 may be important in preventing damaging lung infection with Pseudomonas in people with CF.

What did you do?

We examined levels of IL-22 in lung tissue from people with CF with a Pseudomonas infection, who were undergoing lung transplantation. We used a mouse to model chronic Pseudomonas lung infection and looked to see if IL-22 was produced and what the effect of IL-22 was against the bacteria. Mice which could not produce IL-22 were compared to mice

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with normal IL-22 levels to discover the effect of IL-22 in preventing and controlling ongoing Pseudomonas infection. In addition we examined the impact on survival, lung damage and weight-loss related to infection.

What did you find?

We showed that patients with CF and Pseudomonas infection have IL-22 in the airways and along the inner airway lining. In mice infected with Pseudomonas, we showed that immune responses able to produce IL-22 developed against the bacteria. However, while we found that the absence of IL-22 in the mouse infection model did not affect the rates of ongoing Pseudomonas infection, level of bacteria in the lung, amount of tissue damage and animal survival. Interestingly, we found that those animals with no IL-22 lost less weight than those with it. IL-22 appears to be linked to be exacerbating weight loss in Pseudomonas infection.

What does this mean and reasons for caution?

Our findings show that IL-22 is produced in the immune response against Pseudomonas infection both in people with CF and a mouse model. However, in the mouse model, IL-22 is unable to prevent or reduce persistent lung infection. Surprisingly we found that IL-22 may play a role in the weight-loss associated with lung Pseudomonas infection. This is important for patients with CF as weight-loss is a significant problem that affects long-term health and survival. We did not investigate in this study the way which IL-22 affects weight-loss. In addition, the effects of IL-22 were examined in the mouse model, whether a similar effect exists in people with CF needs to be confirmed.

What's next?

The effect of IL-22 in exacerbating weight-loss in response to lung infection with Pseudomonas infection is important so further work is needed to investigate the mechanism(s) by which IL-22 cause weight-loss.

Original manuscript citation in PubMed

http://www.ncbi.nlm.nih.gov/pubmed/?term=IL-22+exacerbates+weight+loss+in+a+murine+model+of+chronic+pulmonary+Pseudomonas+aeruginosa+infection