

Research identifies a new bacterial foe in cystic fibrosis

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Exacerbations in cystic fibrosis (CF) may be linked to chronic infection with a bacterium called *Stenotrophomonas maltophilia*, which was previously thought to simply colonize the CF lung. The finding that chronic infection with *S. maltophilia* is independently linked with an increased risk of exacerbations gives clinicians and researchers a new potential measure of the health status of CF patients, as well as a new potential target in fighting their disease.

The findings were published online ahead of the print edition of the American Thoracic Society's [American Journal of Respiratory and Critical Care Medicine](#).

"Our study showed that chronic infection with *S. maltophilia*, which was previously not regarded as prognostically significant, may have a real impact on the progression of CF in patients," said Valerie Waters, M.D., assistant professor of infectious diseases at the Hospital for Sick Children in Toronto. "We hope that this study is a starting point for further research, which may point to therapeutic possibilities associated with controlling these infections."

CF is a congenital disease that is characterized by thick, sticky mucus in the lungs and digestive tract, leading to [chronic infections](#) and shortened life. Over time, exacerbations in CF can lead to permanent loss of lung function, thus driving the progression of this deadly disease.

About one in 31,000 people are born with CF, and there is no cure,

although new treatments have dramatically improved and extended the lives of CF patients in recent decades. At present, the average lifespan of a CF patient is 35 years.

As CF patients are living longer than ever before, respiratory tract colonization and infection with multi-drug resistant pathogens are increasing in frequency. Among these, *S. maltophilia* is particularly common and is isolated from the respiratory tract of up to a third of CF patients. To assess whether *S. maltophilia* represented a true infection, rather than merely a colonizing organism, and whether it had an impact on the progression of disease, Dr. Waters and colleagues performed a two-stage study. In the first stage, they sought to determine if *S. maltophilia* generated an immune response in CF patients. In the second stage, they retrospectively followed almost 700 CF patients for 12 years to determine whether chronic infection with *S. maltophilia* was independently associated with an increased risk of exacerbation or lowered lung function.

They found that antibody levels to *S. maltophilia* flagellin, were about two times higher in chronically infected patients compared to those who were never infected, indicating a specific immune response and a true infection, rather than mere colonization. The increased antibody levels were also associated with lower lung function, as measured by FEV1 (forced expiratory volume in one second.)

Furthermore, they found that patients with chronic *S. maltophilia* infections had a 63 percent greater risk of exacerbations than those who had never been infected, although there were no significant differences detected in the rate of lung function decline.

"This is the first study to our knowledge that demonstrates CF patients with chronic *S. maltophilia* infection have a specific immune response, which is in turn associated with lower lung function," said Dr. Waters.

"There have been few studies that investigate the effect of *S. maltophilia* infection on clinical outcomes; those that have been short-term and have not shown any significant clinical effects of the infection. This study, however, points to the possibility that chronic infection has a real and significant clinical impact on these patients."

While the length of the study may not have been sufficient to determine any possible differences in lung function between chronically infected CF patients and those who were intermittently or never infected, Dr. Waters points out that these effects may in fact occur, possibly in younger patients.

"It is crucial that we look to determine whether chronic *S. maltophilia* infection directly results in the worsening of lung function," she said. "We plan to investigate the effects of chronic *S. maltophilia* during pulmonary exacerbations in future studies."

Provided by American Thoracic Society

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