



Cystic Fibrosis Research News

Title:

Lung-Kidney Axis in Cystic Fibrosis: Early Urinary Markers of Kidney Injury Correlate with Neutrophil Activation and Worse Lung Function

Lay Title:

Understanding the Connection Between the Lungs and Kidneys in Cystic Fibrosis

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What was your research question?

We wanted to understand whether lung infections and inflammation in cystic fibrosis (CF) contribute to early kidney injury. Specifically, we investigated whether markers of kidney injury could be detected early and whether they are related to lung infections and inflammation.

Why is this important?

People with CF are living longer, thanks to advances in treatments, but this has revealed new challenges, such as kidney problems. While CF primarily affects the lungs, people with CF are at higher risk of kidney problems as they age, particularly due to their treatments and underlying inflammation. In CF, kidney damage can occur before traditional tests (such as measuring kidney filtration rates) are able to detect it. Detecting kidney injury early could help improve treatment and prevent more severe complications. However, traditional tests often miss early signs of kidney damage. Exploring the “lung-kidney connection” in CF could provide new insights into managing the disease holistically.

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What did you do?

We collected urine and blood samples from adults with CF and compared them to healthy individuals. We measured kidney injury markers and signs of inflammation, including the levels of immune cells in urine. We also analyzed lung function and infection status to look for connections between lung health and kidney damage.

What did you find?

We discovered that people with CF had higher levels of kidney injury markers in their urine, even when traditional kidney function tests appeared normal. Worse lung function and chronic infections with *Pseudomonas aeruginosa* were strongly linked to these markers. Additionally, immune cells called neutrophils, which are highly active in the lungs during infection, were increased in the urine of people with CF who had worse lung function.

What does this mean and reasons for caution?

Our findings suggest that it may be important to monitor signs of kidney injury in people with CF, particularly during lung infections. Monitoring specific markers in urine could help detect kidney injury earlier, guiding more tailored treatment strategies. However, this study is limited by its sample size and cross-sectional design, meaning we cannot establish direct cause-and-effect relationships. More research is needed to confirm these results and understand the long-term impacts of lung infections and treatments on kidney health.

What's next?

Future studies will focus on larger cohorts and examine these markers over time to better understand how kidney injury develops in CF. We also aim to explore how advanced CF treatments, such as modulator therapies, impact both lung and kidney health. Our ultimate goal is to improve detection, prevention, and care for kidney complications in CF.

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