

Resistance to anti-viral drug may be more likely in cystic fibrosis patients

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A drug called ganciclovir is given to lung transplant patients to protect against a life-threatening virus that is common after transplantation.

Ganciclovir reduces mortality due to the virus from 34 percent to between 3 and 6 percent. But between 5 percent and 10 percent of [patients](#) infected with the virus have strains that are resistant to the [drug](#).

A Loyola University Medical Center study found that such resistance may occur more frequently in [cystic fibrosis](#) patients. These patients were found to have insufficient levels of the drug in their bloodstream, enabling the virus to continually replicate. This in turn may increase the chance that mutations will occur and result in drug resistance.

The study suggests that cystic fibrosis patients should be monitored to ensure there are therapeutic levels of ganciclovir in their bodies, said James Gagermeier, MD, first author of the study. The study is published online ahead of print in the journal *Transplant Infectious Disease*.

Lung [transplant patients](#) take immune-suppressing drugs to prevent rejection of their new lungs. But suppressing the immune system makes the patient more vulnerable to a virus called cytomegalovirus (CMV).

Gagermeier and colleagues reviewed records of 51 Loyola lung transplant patients. Twenty-one patients had CMV infection. Ten of these infected patients responded well to ganciclovir, meaning the virus was eliminated and symptoms improved within 14 days. Of the

remaining 11 patients, 6 patients with sufficient levels of ganciclovir experienced a delayed (longer than 14 days) but appropriate response to the drug. Five patients with insufficient levels of ganciclovir did not respond to the drug; all five of these patients had drug-resistant strains of the CMV [virus](#).

Four of the five patients who did not respond to ganciclovir (80 percent) had cystic fibrosis. By contrast, only 2 of the 16 patients who responded to the drug (12.5 percent) had cystic fibrosis.

Cystic [fibrosis patients](#) lack pancreatic enzymes that facilitate the absorption of food and medicines. They also clear drugs out of the body more quickly, Dr. Gagermeier said.

Results of the study suggest that [cystic fibrosis patients](#) who have had lung transplants should be closely monitored to ensure they have adequate levels of ganciclovir in their blood stream, Dr. Gagermeier said.

The study has limitations. It is a retrospective study with a small sample size, and patient compliance with the antiviral medications was not systematically evaluated. Thus it's possible that poor compliance may have contributed to infection with CMV and/or resistance to ganciclovir. Importantly, genetic analysis was not performed on all patients with CMV infection, and therefore cases of ganciclovir resistance may not have been detected.

The study is titled "Subtherapeutic ganciclovir (GCV) levels and GCV-resistant cytomegalovirus in lung transplant recipients."

Provided by Loyola University Health System

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