# T cell imbalance increases risk for gastrointestinal infection recurrence

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University of Cincinnati (UC) researchers have found that an imbalance in the regulation of certain T cells-the cells in the body that fight off infection or attack the system in certain autoimmune diseases-may put certain people at a higher risk of having recurrent cases of *Clostridium difficile*, or C. Diff, infection.

These findings are being presented via poster during Digestive Disease Week, Monday, May 21, 2012, in San Diego.

*C. difficile* is a bacterium that can be naturally found inside the digestive tract, but if an overgrowth occurs, it can cause symptoms ranging from diarrhea to life-threatening inflammation of the colon. Illness from *C. difficile* was once more common in older adults who were hospitalized or in long-term care facilities and typically occurred after use of antibiotic medications; however, it's becoming more frequent in the general population and is more difficult and expensive to treat.

"Fifteen to 20 percent of patients with C. diff infection have recurrence after the completion of initial antibiotic treatment-which is the current standard of care-and up to 65 percent of this group of patients have a recurrent infection," says Bruce Yacyshyn, MD, professor in the digestive diseases division and lead investigator on the research. "The ability of the patient to clear the infection has been linked to antibody molecules, known as IgG, to toxins from the bacterium, but little research has done to study T cell response in initial and recurrent patients."

T cells, or T lymphocytes, belong to a group of white blood cells known as lymphocytes and play a central role in cell-mediated immunity.

In the study, researchers identified patients as initial (never having prior C. diff infection), or recurrent (having at least one documented infection within two weeks to one year after antibiotic treatment) and drew blood samples to be analyzed for T cell counts. Healthy control subjects and case controls, or patients in the hospital with similar risks to C. diff patients, were also examined.

"All patients with C. diff infection were found to have a lower T cell count in their blood samples and have significantly more 'regulatory' cells, which play a part in bacterial intestinal balance but can also activate and direct other T cells to fight," he says. "Although high in both groups, there were no significant differences in the levels of T cells that cause harmful autoimmune, or inflammatory, responses (TH17+) in patients with initial infection and recurrent infection."

Yacyshyn says that researchers do think that the trend-a greater percentage of both the "regulatory" cells and the TH17 cells in recurrent patients-could be an important finding for targeting recurrence rates.

"In identifying these cells as being more prevalent in patients who have recurrent infection, we can eventually create targeted molecular therapies to regulate their activation and stop recurrence," he continues. "This pharmacoeconomic analysis could save hospitals and patients millions of dollars in treatment costs and could greatly improve patient care by targeting the specific mechanism that are not allowing the infection to be cured."

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