

Monitoring the microbiome in leukemia patients could reduce infections during chemotherapy

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Researchers report that a patient's microbial diversity, even before they start cancer treatment, can be linked to risk of infection during induction chemotherapy. This research is presented at ASM's Interscience Conference of Antimicrobial Agents and Chemotherapy (ICAAC/ICC).

Jessica Galloway-Peña, Ph.D., fellow in the Department of Infectious Diseases, Infection Control and Employee Health at The University of Texas MD Anderson Cancer Center, and her colleagues show that disruption of the microbiome by illness or the administration of therapeutics can often lead to detrimental effects in a patient, particularly in immunocompromised cancer [patients](#) with an increased probability for infectious complications.

The microbiome is all of the microscopic organisms present in association with the human body. Many microorganisms live in harmony with their human hosts, as well as living in equilibrium with other microorganisms in order to provide functions essential for human health and survival.

"We found the baseline microbial diversities from stool samples were significantly lower in patients that developed infections during chemotherapy compared to those that did not," said Galloway-Peña. "Additionally, there is a significant decrease in oral and intestinal microbial diversity over the course of chemotherapy," she added.

On top of decreases in microbial diversity, it was also shown that over the course of chemotherapy there was an increase in the presence of specific groups of microorganisms known to cause infection. In those cases, patients' intestinal microbiomes would often be dominated by those classes of infectious agents. Patients that were able to maintain a healthy microbiome remained

infection free in the 90 days post chemotherapy.

Furthermore, it was found that of the most common treatment antibiotics, carbapenems, most significantly decreased [microbial diversity](#).

"This study shows that in the future doctors could use microbiome sampling in order to predict the chance of [infectious complications](#) during chemotherapy, and that monitoring of a patient's microbiome during [induction chemotherapy](#) could also predict their risk for microbial related illness during subsequent treatments," said Galloway-Peña. Additionally, these patients receive vast amounts of antibiotics (on average, approximately 5 different antibiotics were received per patient in this study) because of the high possibility of infections. Monitoring of the microbiome could potentially mitigate the over use of antimicrobials by stratifying patients into low and high risk groups as well as be used to predict on-coming infections. This could, in turn, improve the antibiotic resistance problem currently plaguing our medical field.

Provided by American Society for Microbiology

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