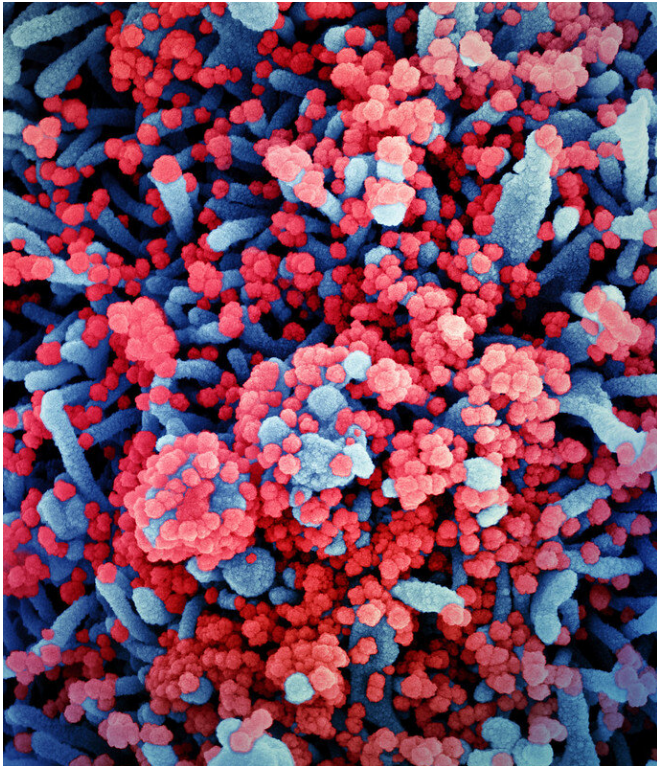


Viral load predicts mortality rate in hospitalized patients with cancer and COVID-19

16 September 2020



Colorized scanning electron micrograph of a cell (blue) heavily infected with SARS-CoV-2 virus particles (red), isolated from a patient sample. Image captured at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIAID

Higher viral loads are associated with a greater risk of death among cancer and non-cancer patients hospitalized with coronavirus disease 2019 (COVID-19), researchers report September 15 in the journal *Cancer Cell*. Among hospitalized COVID-19 patients, those with hematologic malignancies who had recently been treated for cancer had the highest levels of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes COVID-19.

"As a community, we've only begun to understand the relationship between SARS-CoV-2 viral load and outcomes," says senior study author Michael Satlin, an assistant professor of medicine in the Division of Infectious Diseases at Weill Cornell Medicine and an assistant attending physician at New York-Presbyterian/Weill Cornell Medical Center. "Currently, this quantitative information is not given to patient care teams, and providers only know if a patient's test is positive or negative. Giving this information to providers of patients with cancer who have COVID-19 could help them decide on which patients should receive more intensive monitoring when they are in the hospital and which should receive new antiviral medicines if these treatments are in short supply."

Worldwide, COVID-19 has affected more than 27 million people and has resulted in approximately 900,000 deaths. Initial reports have suggested that patients with cancer may be more likely to develop severe COVID-19 than patients without cancer. Satlin and his collaborators previously found that high SARS-CoV-2 viral load upon presentation to the emergency department is associated with in-hospital mortality among the general inpatient population. But until now, it was not clear how admission viral load may affect the clinical outcomes of hospitalized patients who have both cancer and COVID-19.

In the new study, Satlin and his team used two standard diagnostic tests to measure the amount of SARS-CoV-2 in nasopharyngeal swab specimens obtained upon admission to three New York City hospitals between March 15 and May 14, 2020. One hundred of the patients had active cancer, and 2,914 patients did not. Among the [cancer patients](#), some had solid tumors, whereas others had [hematologic malignancies](#), which affect blood, blood cell-producing tissue called [bone marrow](#),

and [lymph nodes](#)—organs making up part of the circulatory and immune systems.

Half of patients with hematologic malignancies had high viral loads, compared to approximately 30% of patients without cancer. Among patients with hematologic malignancies, only those who had received chemotherapy or targeted therapy during the previous six months had significantly higher viral loads than the general inpatient population with COVID-19.

"We suspect that this finding may be from the underlying immunodeficiencies conferred by either the hematologic malignancies or the administered therapies, which may decrease the ability to inhibit proliferation of SARS-CoV-2," says co-first author Lars Westblade, an associate professor of pathology and laboratory medicine at Weill Cornell Medicine and a clinical microbiologist at NewYork-Presbyterian/Weill Cornell Medical Center.

"Additional studies with a larger sample size of patients with hematologic malignancies are needed to more definitely assess whether these patients have increased mortality when hospitalized with COVID-19."

Overall, the in-hospital mortality rate was 38.8% among patients with a high viral load, 24.1% among patients with a medium viral load, and 15.3% among patients with a low viral load. Cancer patients showed a similar pattern, with mortality rates of 45.2%, 28.0%, and 12.1%, respectively. High viral loads in patients with cancer were associated with increased in-hospital mortality than low viral loads. This finding remained statistically significant, even after adjusting for factors such as age and need for supplemental oxygen within three hours of presentation to the emergency department.

One important caveat is that it is not clear whether viral load predicts mortality rate in non-hospitalized individuals with COVID-19. "We encourage subsequent studies to assess the potential role of using SARS-CoV-2 [viral load](#) to guide care for outpatients with and without cancer," says co-first author Gagandeep Brar, an assistant professor of medicine in the Division of Hematology and Medical Oncology at Weill Cornell Medicine and an

assistant attending physician at NewYork-Presbyterian/Weill Cornell Medical Center.

For their own part, the researchers plan to conduct larger studies to confirm their findings and investigate whether specific types of cancer and [cancer](#) treatments lead to higher viral loads and worse outcomes. They would also like to assess whether measuring viral loads over time in a given patient could be used to personalize the type and duration of therapy.

More information: Lars F. Westblade et al, SARS-CoV-2 Viral Load Predicts Mortality in Patients with and Without Cancer Who Are Hospitalized with COVID-19, *Cancer Cell* (2020). [DOI: 10.1016/j.ccell.2020.09.007](#)

Provided by Cell Press

APA citation: Viral load predicts mortality rate in hospitalized patients with cancer and COVID-19 (2020, September 16) retrieved 30 October 2020 from <https://medicalxpress.com/news/2020-09-viral-mortality-hospitalized-patients-cancer.html>

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