

Blood cancer patients with COVID-19 fare better with convalescent plasma

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Jeffrey P. Henderson, MD, PhD, an associate professor of medicine and of molecular microbiology at Washington University School of Medicine in St. Louis, holds a bag of convalescent plasma. He is an author on a new study that shows that such plasma from recovered COVID-19 patients can dramatically increase the likelihood of survival for blood cancer patients hospitalized with COVID-19. Credit: Matt Miller/Washington University

A large, retrospective, multicenter study involving Washington University School of Medicine in St. Louis indicates that convalescent plasma from recovered COVID-19 patients can dramatically improve likelihood of survival among blood cancer patients hospitalized with the virus.

The therapy involves transfusing [plasma](#)—the pale yellow liquid in blood that is rich in antibodies—from people who have recovered from COVID-19 into patients who have leukemia, lymphoma or other blood cancers and are hospitalized with the viral infection. The goal is to accelerate their disease-fighting response. Cancer patients may be at a higher risk of death related to COVID-19 because of their weakened immune systems.

The data, collected as part of a national registry, indicate that patients who received convalescent plasma from donors who had recovered from COVID-19 had a death rate of 13.3% compared with 24.8% for those who did not receive it.

The difference was especially striking among severely ill patients admitted to intensive care units (ICUs). Such patients treated with convalescent plasma had a death rate of 15.8% compared with 46.9% for those who didn't receive the treatment.

"These results suggest that convalescent plasma may not only help COVID-19 patients with blood cancers whose immune systems are compromised, it may also help patients with other illnesses who have weakened antibody responses to this virus or to the vaccines," said Jeffrey P. Henderson, MD, Ph.D., an associate professor of medicine and of molecular microbiology at Washington University. "The data also emphasize the value of an antibody therapy such as convalescent plasma as a virus-directed treatment option for hospitalized COVID-19 patients."

The research is published June 17 in the journal *JAMA Oncology*.

Henderson collaborated with researchers from the international COVID-19 & Cancer Consortium (CCC19) formed over a year ago to collect and analyze data on the disease's unique interactions. More than 70 institutions in the consortium—including Advocate Aurora Health in Wisconsin and Illinois, Vanderbilt University Medical Center in Nashville, Tenn., and the Mayo Clinic in Rochester, Minn.—participated in this study.

The scientists looked back at patient data to compare the 30-day mortality of 966 hospitalized adults with a blood cancer, such as leukemia, lymphoma or multiple myeloma, who also were diagnosed with COVID-19. The patients, whose average age was 67, were hospitalized at some

point from March 17, 2020, through Jan. 21, 2021, due to complications from COVID-19.

Of the patients studied, 143 received convalescent plasma, and 823 did not. Of the 338 patients admitted to ICUs because of severe COVID-19 symptoms, such as difficulty breathing or cardiac distress, those who received the treatment were more than twice as likely to survive.

"In March 2020, the Food and Drug Administration provided a pathway for hospitalized patients to receive COVID-19 convalescent plasma if requested by their physicians," Henderson explained. "After this, the decision to give convalescent plasma was made by physicians and patients on a case-by-case basis. There were no restrictions on when during the course of illness convalescent plasma could be given to patients."

Early in the pandemic, many scientists urged evaluation of convalescent plasma to treat the virus, based on the plasma's historical effectiveness in fighting other viruses. During the 1918 Spanish flu pandemic, some newly infected patients were treated successfully with plasma from people who had recovered from the flu. Additionally, during the outbreaks of severe acute respiratory syndrome (SARS) in 2002 and 2003, health-care workers used plasma transfusion experimentally and, in many cases, successfully to treat small numbers of people. SARS is caused by a coronavirus closely related to the one that causes COVID-19.

However, limited data on the novel coronavirus also caused pause among physicians. Randomized controlled trials—the gold standard in research—proved elusive, in most cases, due to the time required to prepare and coordinate adequate trials, and the need for scientists to prioritize among multiple investigational treatment options. Some preliminary results also disappointed, showing convalescent plasma only worked as a treatment in the general patient population if infused within days after diagnosis in patients who hadn't yet progressed to having severe complications.

"As more COVID-19 patients began receiving convalescent plasma, we started hearing

physicians around the country report remarkable clinical improvements following convalescent plasma infusions in COVID-19 patients with blood cancers and antibody deficiencies, some of whom were already very ill," said Henderson, one of several physicians who formed the COVID-19 Convalescent Plasma Program Leadership Group to study the use of convalescent plasma for treating COVID-19. "I have seen one of my own patients with blood cancer quickly improve after receiving convalescent plasma. Similar stories that were often very detailed suggested that a formal study would help physicians with decisions they were already making on a daily basis."

During the past year, over phone calls, emails and Zoom chats, updates on convalescent plasma—its historical success and its prospects for COVID-19—were a staple in conversations between Henderson and his longtime friend and co-author Michael Thompson, MD, Ph.D., who also was his roommate during undergraduate school at the University of Wisconsin in Madison. Thompson is now an oncologist and hematologist at Advocate Aurora Health, and Advocate Aurora Research Institute, both in Wisconsin, as well as a member of the steering committee of the COVID-19 & Cancer Consortium.

"It became increasingly evident that patients with leukemia, lymphoma and other blood cancers were particularly susceptible to severe COVID-19 and that COVID-19 may develop in a unique way in these patients," said Henderson. "We discussed that we might learn something from patients in the COVID-19 & Cancer Consortium, and things started to snowball from there."

Henderson contacted fellow researchers in the COVID-19 Convalescent Plasma Program, including Michael J. Joyner, MD, who is a professor of anesthesiology at the Mayo Clinic and works closely with the FDA. Thompson reached out to Jeremy Warner, MD—a professor of medicine at Vanderbilt, a steering committee member of the COVID-19 consortium and who operates the CCC19 registry. Together, the researchers plumbed the group's registry of de-identified data abstracted from medical records.

"The data started coming fast and furious," Henderson recalled.

"Given that patients with [blood cancers](#) have higher mortality rates from COVID-19, we suspect our findings, along with other similar cases not in this database, support using [convalescent plasma](#) to improve survival in these patients," Thompson said.

Henderson and Thompson contributed equally as the study's first authors. Joyner is a co-author, and Warner is the senior author. "Despite the inevitable limitations of retrospective data, we find these results compelling and certainly hope that they will be quickly investigated in a prospective clinical trial," Warner added. "We are exploring future research, including whether there is an interplay between patient factors and treatments received prior to the development of COVID-19, such as B-cell depleting monoclonal antibodies."

More information: *JAMA Oncology* (2021). [DOI: 10.1001/jamaoncol.2021.1799](#)

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