Similar outcomes for hospitalized COVID-19 patients on immunosuppressive medications, non-immunosuppressed patients

November 16 2021

Credit: Unsplash/CC0 Public Domain

A large, nationwide study of COVID-19 cases led by researchers at the Johns Hopkins Bloomberg School of Public Health has found that people

taking medications that suppress the immune system—for example, to prevent transplant rejection or to treat cancer—overall do not have a higher risk of dying from COVID-19 or being put on a ventilator than non-immunosuppressed hospitalized COVID-19 patients.

The researchers analyzed electronic health records of adults hospitalized with COVID-19 from January 2020 to June 2021, covering 222,575 individuals, including 16,494—7 percent of the total cases in the study period—in which patients had been on immunosuppressive medications prior to hospitalization. The researchers separated these medications into 17 classes and found that none were associated with a significantly increased risk of being put on a ventilator—an indication of severe COVID-19 illness.

The results were published online November 15 in *The Lancet Rheumatology*.

"In general, people taking immunosuppressive medications may be reassured that they can safely continue to do so during this pandemic," says study lead author Kayte Andersen, MSc, a doctoral candidate in the Bloomberg School's Department of Epidemiology.

"These findings are encouraging and important, given how commonly these medications are used," says G. Caleb Alexander, Professor of Epidemiology at the Bloomberg School.

Estimates suggest that there are approximately 10 million immunocompromised people in the U.S. People who take immunosuppressive drugs for organ transplants, autoimmune diseases, cancers and other conditions were considered, at the outset of the pandemic, as being at potentially increased risk of severe outcomes, given their weakened immune systems. On the other hand, some of the damage to lungs and other organs in severe COVID-19 comes less from

direct viral damage and more from immune overactivation. By the summer of 2020, doctors were treating severe COVID-19 with immunosuppressive drugs such as dexamethasone. It was not initially clear whether the long-term use of immunosuppressive drugs increased or decreased the risk of severe COVID-19.

In a smaller, preliminary study published earlier this year, Andersen, Alexander, and their colleagues found no significant association between the chronic use of immunosuppressive drugs and ventilator or mortality risk—suggesting that perhaps any increased susceptibility to infection and viral spread may be balanced by a decreased susceptibility to harmful inflammation. This earlier study analyzed the health records of more than 2,000 hospitalized COVID-19 patients from the Johns Hopkins Medicine network.

The new study, drawing from a nationwide dataset gathered by the National COVID Cohort Collaborative, covered a sample of COVID-19 patients that was over 100 times larger than the preliminary study. The study found that overall, hospitalized COVID-19 patients taking immunosuppressive drugs did not face significant increases in the risk of COVID-19 death compared with non-immunosuppressed hospitalized COVID-19 patients.

Of the 303 drugs examined in the study, the authors found that one drug, rituximab, a monoclonal antibody preparation that targets antibody-producing B cells, was associated with a substantially increased risk of death compared to medically similar hospitalized COVID-19 patients. Rituximab is used for serious medical conditions like cancer or an autoimmune disorder that has not responded to other treatments.

The analysis included 153 cancer patients taking rituximab and 100 patients taking rituximab for a rheumatologic condition. After accounting for sex, age, medical conditions, and other factors, the risk of

death for the cancer patients taking rituximab was more than double and the risk for patients with a rheumatologic condition was nearly three-quarters higher compared with medically similar people in the study.

"Given the finding, patients taking rituximab should discuss their options with their doctor," says Andersen. "At a minimum, people who take rituximab should continue to protect themselves from developing COVID-19. It also makes it all the more important that people around those taking rituximab get vaccinated."

A commentary accompanying the paper in *The Lancet Rheumatology* discusses the rituximab finding and suggests two potential paths for patients and clinicians—proceeding with rituximab or using alternative therapies.

Andersen and colleagues' analysis also linked a relatively new class of immunosuppressive drugs called JAK inhibitors, which are used to treat arthritis, inflammatory bowel disease, and other inflammatory conditions, to a significantly lower risk—58 percent—of COVID-19-related in-hospital death. JAK inhibitors such as baricitinib have recently been used to treat severe COVID-19.

More information: Kathleen M Andersen et al, Long-term use of immunosuppressive medicines and in-hospital COVID-19 outcomes: a retrospective cohort study using data from the National COVID Cohort Collaborative, *The Lancet Rheumatology* (2021). DOI: 10.1016/S2665-9913(21)00325-8

Provided by Johns Hopkins University Bloomberg School of Public Health