Even partially vaccinated individuals hospitalized with COVID-19 may be at lower risk of ICU admission, death

April 25 2022

Credit: Unsplash/CC0 Public Domain

Even when COVID-19 vaccines fail to prevent hospitalization, they appear to significantly lower the risk of being admitted to intensive care

and dying compared to patients who are unvaccinated, according to a time-matched cohort study of over 20,000 adults hospitalized in Ontario between January 2021 and January 2022, being presented at this year's European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Lisbon, Portugal (23-26 April). The study is by Alicia Grima and Kiera Murison from the University of Toronto, Ontario, Canada and colleagues.

"The good news from this study is that, even when hospitalized with COVID-19, both partial and complete vaccination, reduced the risk of requiring treatment in intensive care and death", says Murison.

The rapid development of safe and effective vaccines against the SARS-CoV-2 virus has drastically reduced the burden of COVID-19-related hospitalization and deaths. However, the risk of breakthrough cases of severe COVID-19 after vaccination remains, particularly among groups at higher risk of severe disease.

Researchers set out to determine whether risks of intensive care unit (ICU) admission and death were diminished by vaccination, even in individuals for whom vaccination failed to prevent hospitalization. Using data from Canada's Case and Contact Management database and Ontario's vaccination and reporting database (COVaxON), they conducted a time-matched cohort of 20,064 adults (3,353 vaccinated and 16,711 unvaccinated) hospitalized with COVID-19 between January 1, 2021 and January 5, 2022. The study was restricted to adults with a first COVID-19 infection. The majority of participants (69%) were aged 50 or older, and most were men (54%).

Because the dominant variant and public health response changed over time, each vaccinated individual was matched with up to five unvaccinated individuals based on test date of positive SARS-CoV-2 infection. Modeling was used to assess the risk of ICU admission

(adjusted for age group, sex, healthcare worker, long-term care, underlying illness, and infecting variant) and death (adjusted for age group, sex, long-term care, comorbidity, and infecting variant). Further unmatched analyses were performed to identify differences in vaccine effects.

The researchers found that vaccination with one, two, or three doses significantly reduced the risk of ICU admission and death. And an inverse dose-response relationship was observed between vaccine doses, with each additional dose reducing the likelihood of ICU admission by 34%, and the odds of dying by 22%. No significant differences in risk were seen regardless of the infecting variant.

"Even with the diminished efficacy of vaccines against infection with novel variants of concerns, our findings indicate that vaccines remain a vital tool for reducing ICU admission and death from COVID-19", says Grima.

This is an observational study, so no firm conclusions can be drawn about cause and effect, and due to the relatively recent emergence of the Omicron variant, as well as lags, the results lacked statistical power to estimate Omicron-specific protections. Also, the authors were unable to ensure that the effects observed are not at least in part due to residual confounding Finally, they cannot rule out the possibility that other unmeasured factors, such as previous natural infection with SARS-CoV-2 in the unvaccinated cohort, may have affected the results.

Provided by European Society of Clinical Microbiology and Infectious Diseases