How the presence of COVID-19 antibodies after vaccination affected infection and hospitalisation in immunosuppressed people during the Omicron wave: The MELODY Study

Background

In the UK, people with weakened immune systems were offered three primary doses of COVID-19 vaccines followed in Autumn 2021 by booster COVID-19 vaccines twice a year. In the MELODY study, we examined whether those who did not develop detectable COVID-19 antibodies after receiving three or more vaccines were at a higher risk of catching the virus or experiencing more severe illness.

What we did

Between December 2021 and June 2022, we recruited people from across the UK who had solid organ transplants (such as kidney or liver), rare autoimmune rheumatic diseases (such as vasculitis, lupus, scleroderma or myositis), or lymphoid blood cancers.

All participants had been vaccinated for COVID-19 at least three times. They tested themselves at home for COVID-19 antibodies using a simple finger-prick test, filled out a questionnaire about their background and health, and were monitored for six months using NHS England data.

What we found

The MELODY study included 21,155 people, and COVID-19 antibodies were detected in the majority of study participants: 77% of those with solid organ transplants, 86% of those with rare autoimmune rheumatic diseases, and 79% of those with lymphoid cancers. Overall, around 1 in 5 people taking part in the study did not have detectable antibodies.

COVID-19 infection was recorded in 3,907 people, with 556 needing hospital care and 17 dying within 28 days of infection (less than 1 in 1000 of the study population).

Rates of COVID infection varied between people and were higher among those who were younger or living with children. Rates of hospitalisation with COVID-19 increased with age and with the number of other illnesses.

In all groups, having COVID-19 antibodies protected against infection and hospitalisation. As fortunately the numbers of people in the study who died were small, we couldn't comment on whether having COVID-19 antibodies reduced the chance of death due to COVID.

The chance of having a COVID-19 infection was reduced in people with COVID-19 antibodies compared to those without measurable antibodies. This reduction was 31% in those with solid organ transplants, 43% in those with rare autoimmune rheumatic diseases, and 38% in those with lymphoid cancers.

People with COVID-19 antibodies were much less likely to be hospitalised due to COVID-19 compared to those without measurable antibodies. Hospitalisation was reduced by 60% in those with solid organ transplants, 68% in those with rare autoimmune rheumatic diseases, and 59% in those with lymphoid cancers. Overall, the likelihood of being hospitalised due to COVID-19 was reduced by two-thirds for those people with antibodies.

Interpretation

We recommend continued COVID-19 vaccination for people with weakened immune systems to boost antibodies because these are known to wane over time. Measuring COVID-19 antibody levels after vaccination can be done on a large scale and helps identify people with weakened immune systems who are still at risk of severe infection. This approach can guide personalised protection choices and national policy for prevention strategies for people with weakened immune systems.

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This is the plain English summary of **Impact of SARS-CoV-2 spike antibody positivity on infection and hospitalisation rates in immunosuppressed populations during the omicron period: the MELODY study**
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