

COVID-19 vaccination: Reasons for earlier boosters

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Symbol picture. Vaccination against COVID-19. Credit: Kiel University

Patients with rheumatic diseases or inflammatory diseases of the intestine (Crohn's disease, ulcerative colitis) and skin (psoriasis) are often treated with medicinal substances that suppress the immune system. These immunosuppressive treatments can prevent flares of the disease, but may also reduce the success of COVID vaccination. A research team from the Cluster of Excellence "Precision Medicine in

Chronic Inflammation" (PMI) in Kiel has investigated whether this is actually the case. The evaluation of short-term vaccination success published in March 2021 revealed that the new mRNA vaccines against COVID-19 are effective and well tolerated for people with chronic inflammatory diseases and undergoing immunosuppressive therapy. In order to gauge the long-term vaccine response, 23 patients undergoing immunosuppressive therapy were re-examined six months after the second vaccination, and compared with a control group of 24 healthy persons. In some of them, antibody levels against SARS-CoV-2 had fallen sharply, as shown in the study published in the rheumatology journal RMD Open.

TNF treatment: Faster decrease in antibody levels

"We saw that the 13 patients treated with TNF alpha blockers had significantly lower [antibody levels](#) than healthy individuals, while the patients in our cohort who receive other basic treatments do not look significantly different to healthy people, also after six months," reported lead author Bimba F. Hoyer, Professor of Rheumatology at the Faculty of Medicine at Kiel University (CAU) and head of the Comprehensive Center for Inflammation Medicine (CCIM) at the University Medical Center Schleswig-Holstein (UKSH), Campus Kiel. This does not necessarily mean that individuals treated with TNF alpha blockers would no longer have protection against infection with the coronavirus. Because it's not only the [antibodies](#) specifically targeted against the virus which protect against infection, but also specialized immune cells. "This cellular vaccine response remains virtually unchanged in patients treated with TNF alpha blockers after six months. Some protection probably remains, but compared to other people, it will be slightly worse," explained Hoyer. "After six months, they certainly need a booster vaccination, but it would probably be a good idea to give them a booster earlier." Whether other immunosuppressive treatments might also affect the protection offered by the [vaccine](#) cannot be determined from the

relatively small study.

Increased risk of breakthrough infections

The most noticeable difference between the individuals treated with TNF alpha blockers and the other groups was observed in the concentrations of neutralizing antibodies. Neutralizing antibodies bind to a virus particle in a very special way, and prevent the virus from infecting a cell. There is still no [threshold value](#) determined for the concentration of neutralizing antibodies which is required for immune protection. "However, initial data from breakthrough infections indicates that decreasing levels of neutralizing antibodies correlate with decreasing protection against SARS-CoV-2," emphasized the rheumatologist from Kiel. The rapid decrease in antibody levels observed in connection with TNF blocker treatment in the Kiel study has yet to be confirmed in larger studies, but should already be considered in the planning of booster vaccinations. And in principle, this problem could also occur with other vaccinations.

More information: Ulf M Geisen et al, Humoral protection to SARS-CoV2 declines faster in patients on TNF alpha blocking therapies, *RMD Open* (2021). [DOI: 10.1136/rmdopen-2021-002008](https://doi.org/10.1136/rmdopen-2021-002008)

Provided by Kiel University

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