Tracking the immune response to SARS-CoV-2 mRNA vaccines in ofatumumab treated RMS patients in a multicenter study

Tjalf Ziemssen[1], Benjamin Ettle[2], Marie Groth[2], Tobias Bopp[3]

[1]Department of Neurology, Center of Clinical Neuroscience, Carl Gustav Carus University Clinic, University Hospital of Dresden, Fetscherstr. 74, 01307, Dresden, Germany.

[2]Novartis Pharma GmbH, Roonstr. 25, D-90429 Nuernberg, Germany.

[3]Institute for Immunology, University Medical Center of the Johannes Gutenberg-University, Mainz, Germany

Introduction

Initial and booster vaccination with the newly developed SARS-CoV-2 mRNA vaccines efficiently protect healthy individuals against COVID-19. As only limited data is available for Multiple Sclerosis (MS) patients with immunosuppressive treatment, this study aims to comprehend the impact of ofatumumab treatment on mounting cellular and humoral immune responses to SARS-CoV-2 mRNA vaccines.

Methods

KYRIOS is an open-label, two-cohort study including 40 MS patients at 8 sites in Germany. Patients receive initial or booster SARS-CoV-2 mRNA vaccination either before (cohort 1) or at least 4 weeks after starting ofatumumab treatment (cohort 2). The impact of ofatumumab treatment on development of SARS-CoV-2 reactive T-cells (primary endpoint) and neutralizing antibodies (secondary endpoint) will be evaluated. Furthermore, immune responses will be monitored and phenotypically described for up to 18 months.

Results

Results of an interim analysis show that SARS-CoV-2 mRNA vaccines can induce cellular and humoral immune responses in ofatumumab-treated patients. Immune responses could be detected as soon as 1 week after the initial vaccination cycle for all patients receiving their initial SARS-CoV-2 vaccines during stable ofatumumab treatment (n=4) or before ofatumumab initiation (n=5). The interim analysis further shows the effect of ofatumumab treatment on development of immune responses after booster vaccines (n=23).

Conclusions

The KYRIOS study demonstrates for the first time that ofatumumab treated patients can mount specific immune responses towards SARS-CoV-2 mRNA vaccines. The results further suggest that both, humoral and cellular immune response, need to be considered for interpretation of vaccine efficacy and are in line with other recently published studies.

TZ has received research support, consulting fee and honoraria for lectures from Alexion, Biogen, Celgene, Merck, Novartis, Roche, Sanofi, Teva.

TB has received consulting fee and honoraria for lectures from Biogen, Celgene, Merck, Novartis, Pathos Therapeutics, Roche, Teva.

BE and MG are employees of Novartis. Sponsor of this study is the Novartis Pharma Vertriebs GmbH.