Tracking the immune response to SARS-CoV-2 mRNA vaccines in an open-label multicenter study in participants with relapsing multiple sclerosis treated with ofatumumab s.c. (KYRIOS clinical trial)

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

Objective

This study aims at understanding the impact of ofatumumab treatment on the development of cellular and humoral immune responses to initial and booster SARS-CoV-2 mRNA vaccines.

Background

Recently developed SARS-CoV-2 mRNA vaccines have been shown to efficiently protect healthy individuals against COVID-19 and contribute greatly towards fighting the COVID-19 pandemic. However, only limited data is available about vaccine-induced immune responses in immunosuppressed patients.

Methods

KYRIOS is an open-label, prospective, two-cohort study at eight sites in Germany including 40 MS patients who receive SARS-CoV-2 mRNA vaccination either before starting ofatumumab treatment (cohort 1) or during stable ofatumumab treatment for at least 4 weeks (cohort 2). The impact of ofatumumab treatment on the proportion of patients having established SARS-CoV-2 reactive T-cells (primary endpoint) and developing SARS-CoV-2 neutralizing antibodies (secondary endpoint) after initial and booster vaccination will be assessed. Additionally, cellular and humoral immune responses will be monitored for up to 18 months and cellular response will be further described by immunophenotyping.

Results

Results of this second interim analysis show the efficacy of SARS-CoV-2 mRNA vaccines to induce cellular and humoral immune responses in MS patients depending on the timing of ofatumumab treatment initiation. First data indicate that in patients vaccinated during stable ofatumumab treatment, specific immune response is detectable as soon as 1 week after the initial vaccination cycle and further increases afterwards.

Conclusions

KYRIOS data show for the first time that patients vaccinated during stable ofatumumab treatment can mount immune responses to SARS-CoV-2 mRNA vaccines. The presented data further emphasize the importance of considering both, humoral and cellular immune response, for interpretation of vaccine efficacy.