MEDIZINISCHE UNIVERSITÄT WIEN

Comparing humoral immune response to SARS-CoV2 vaccines in multiple sclerosis and healthy controls: an Austrian multi-center study

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Background

Disease-modifying treatments (DMT) might limit immune response to vaccination against SARS-CoV2. However, data informing on differences in efficacy and safety of available vaccines in MS patients are scarce.

Objective

To compare rate of humoral immune response and safety of SARS-CoV-2 vaccines in pwMS and healthy controls (HC).

Patients and Methods

In this multicenter prospective observational study on 456 pwMS and 116 HC, SARS-CoV-2 IgG response was measured using anti-spike protein-based serology 3 months after the first dose. The primary endpoint was defined as the proportion of patients developing protective antibodies (seroconversion), secondary endpoints included antibody titer, efficacy and safety parameters.

Results

Compared to 97.4% in HC, seroconversion occurred in 96.7% (88/91) of untreated MS patients, 97.1% (135/139) on immunomodulatory (IM-DMT) and 61.1% (138/226, p<0.001) on immunosuppressive DMT (IS-DMT, Figure 1).
Specifically, seroconversion was lowest under antiCD20 monoclonal antibodies (CD20mAb; 52.6%) followed by sphingosine 1 receptor modulators (S1PM; 63.6%, Figure 2).
Predictors of seroconversion were IS-DMT (OR 0.04; p<0.001), CD20 mAb (OR 0.03, p<0.001), S1PM (OR 0.05, p<0.001) and the combined group of cladribine and alemtuzumab (OR 0.18, p<0.001).
In the S1PM subgroup likelihood of seroconversion increased with higher lymphocyte count (OR 1.31 per 0.1 G/l, p=0.035), while in patients on cladribine/alemtuzumab seroconversion was associated with time since last DMT intake (OR 1.38 per month) but not with lymphocyte count.
In patients treated with CD20mAb, complete B-cell depletion significantly decreased probability of seroconversion (OR 0.52, p=0.038), whereas time since last DMT intake was not.
Safety of SARS-CoV-2 vaccines in MS patients was excellent and similar to HC.

Figure 1. Seropositivity and antibody titer levels 3 months after SARS-CoV2 vaccination according to DMT categories.

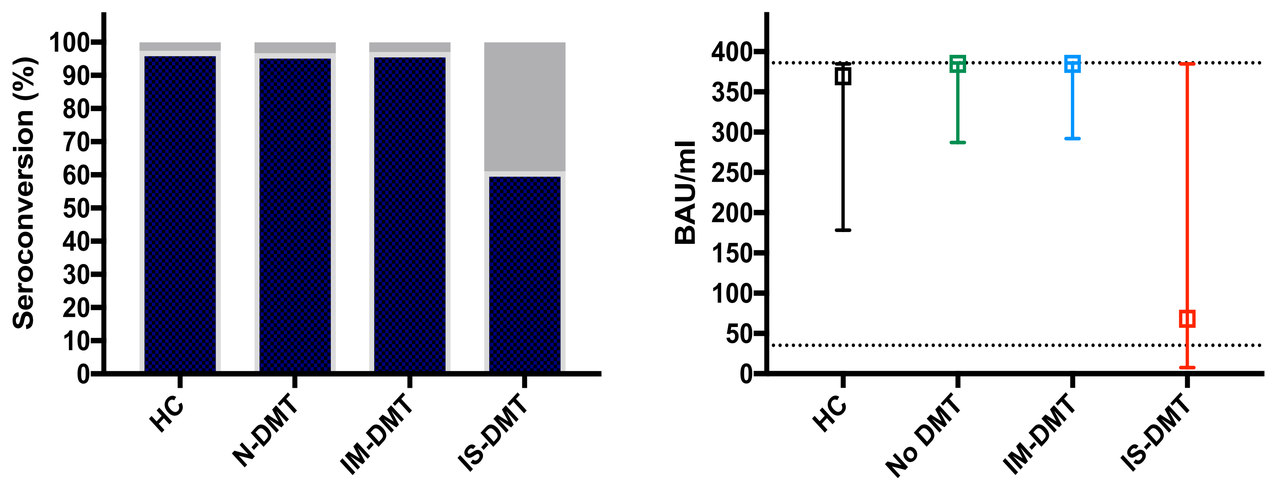


Figure 2. Seropositivity and antibody titer levels 3 months after SARS-CoV2 vaccination according to DMT substances.

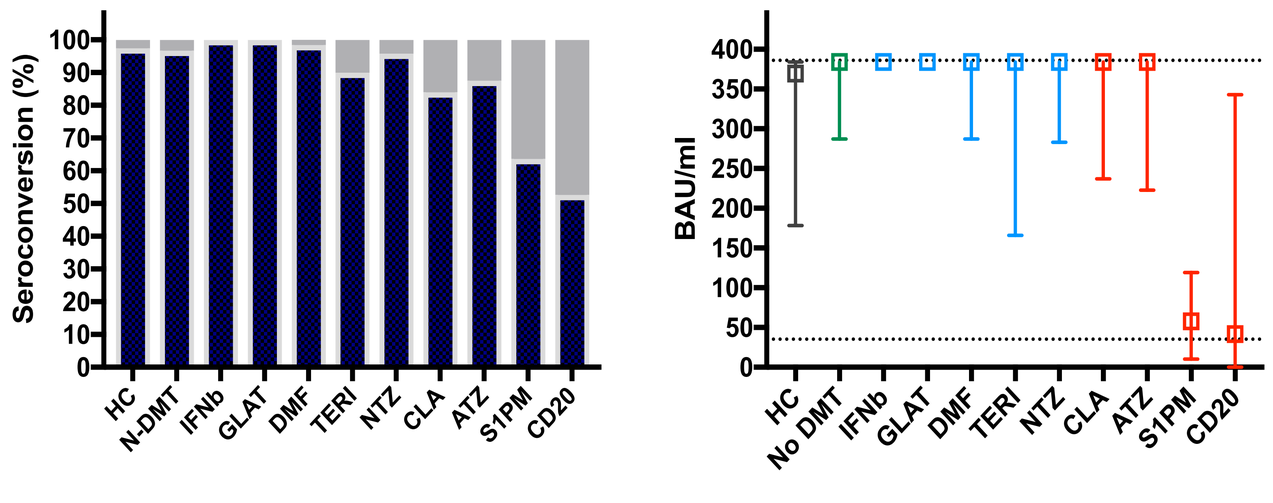
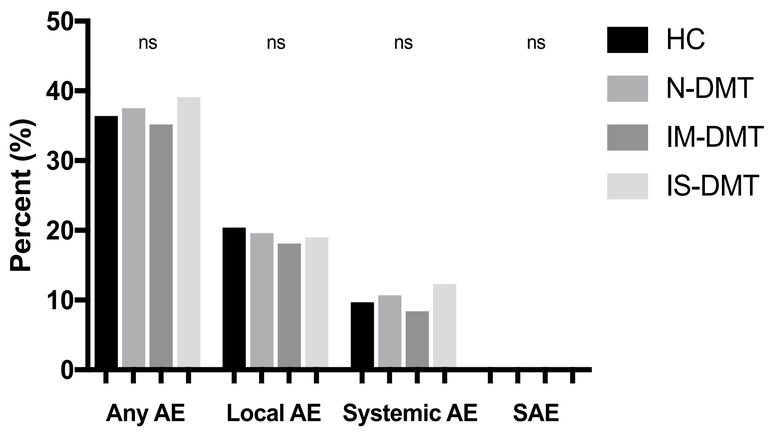


Figure 3. Frequency of adverse events and severe adverse events 3 months after SARS-CoV2 vaccination



Efficacy 3 Months after vaccination

- 3 reported Covid-19 cases
  1 HC: mild symptoms
  1 No DMT: asymptomatic course
  1 IS-DMT: mild symptoms
- No hospitalization
- No death

Conclusion

Humoral response to SARS-CoV2 vaccines in MS patients is generally excellent.
While reduced by immunosuppressive DMT, most importantly by B-cell depleting **CD20mAb** and **S1PM**, protective **humoral response** is still expected in the **majority of patients**.
SARS-CoV2 vaccination should be offered to every MS patient.

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