World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:15, No:12, 2021

Efficacy and Safety of COVID-19 Vaccination in Patients with Multiple Sclerosis: Looking Forward to Post-COVID-19

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Abstract : Introduction: As coronavirus disease 2019 (COVID-19) vaccination is currently spreading around the world, it is of importance to assess the ability of multiple sclerosis (MS) patients to mount an appropriate immune response to the vaccine in the context of disease-modifying treatments (DMT's). Objectives: Evaluate immunity generated following COVID-19 vaccination in MS patients, and assess factors contributing to protective humoral and cellular immune responses in MS patients vaccinated against severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) virus infection. Methods: Review our recent data related to (1) the safety of PfizerBNT162b2 COVID-19 mRNA vaccine in adult MS patients; (2) the humoral post-vaccination SARS-CoV2 IgG response in MS vaccinees using anti-spike protein-based serology; and (3) the cellular immune response of memory B-cells specific for SARS-CoV-2 receptor-binding domain (RBD) and memory T-cells secreting IFN-g and/or IL-2 in response to SARS-CoV2 peptides using ELISpot/Fluorospot assays in MS patients either untreated or under treatment with fingolimod, cladribine, or ocrelizumab; (4) covariate parameters related to mounting protective immune responses. Results: COVID-19 vaccine proved safe in MS patients, and the adverse event profile was mainly characterised by pain at the injection site, fatigue, and headache. Not any increased risk of relapse activity was noted and the rate of patients with acute relapse was comparable to the relapse rate in non-vaccinated patients during the corresponding follow-up period. A mild increase in the rate of adverse events was noted in younger MS patients, among patients with lower disability, and in patients treated with DMTs. Following COVID-19 vaccination protective humoral immune response was significantly decreased in fingolimod- and ocrelizumab- treated MS patients. SARS-CoV2 specific B-cell and T-cell cellular responses were respectively decreased. Untreated MS patients and patients treated with cladribine demonstrated protective humoral and cellular immune responses, similar to healthy vaccinated subjects. Conclusions: COVID-19 BNT162b2 vaccine proved as safe for MS patients. No increased risk of relapse activity was noted post-vaccination. Although COVID-19 vaccination is new, accumulated data demonstrate differences in immune responses under various DMT's. This knowledge can help to construct appropriate COVID-19 vaccine guidelines to ensure proper immune responses for MS patients.

Keywords : covid-19, vaccination, multiple sclerosis, IgG
Conference Title : ICICIMV 2021 : International Conference on Immunotoxicology, Cellular Immunology and Molecular Vaccines
Conference Location : New York, United States
Conference Dates : December 09-10, 2021