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Editorial

COVID-19 Vaccination in Immunocompromised Persons: Challenges in COVID-19 Control and Prevention

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Editorial

Preliminary data of phase II/III clinical trials of BNT162b2 (Pfizer/BioNTech) and mRNA-1273 (Moderna) vaccines those were investigated in more than 50 million COVID-19 cases and 1.35 million COVID-19 related deaths worldwide revealed to be about 95 % effective in COVID-19 prevention and both trials revealed more than 90 % of lowering the severe-COVID-19 illness risk, whereas these clinical vaccine trials excluded immunocompromised patients, patients on immunosuppressive drugs, or those with immunosuppressive status [1-4]. BNT162b2 (Pfizer/BioNTech) and mRNA-1273 (Moderna) vaccines encode the RBD of SARS-CoV-2 (COVID-19) spike protein and the S-2P antigen, respectively [5,6]. A strong humoral response and strong cellular response were elicited by both vaccines through neutralizing-antibody production and a strong cellular response and through inducing Th1-cytokine production and functional and pro-inflammatory CD4+ and CD8+ T-cells, respectively [5,6]. Methotrexate and rituximab can decrease the neutralizing-antibody-to-neoantigen production, such as SARS-CoV-2 (COVID-19) that have been demonstrated the reduction of humoral responses to pneumococcal and seasonal influenza vaccines [7,8]. Hypothetically, humoral suppression by methotrexate is mediated by increasing regulatory B cells and immunosuppressive adenosine and interaction with the B-cell Activation Factor

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(BAF) and with significant improvement by temporarily discontinuing for 2 weeks post-influenza vaccination, whereas rituximab directly suppresses CD20+ B-cells that is significant humoral-response-to-polysaccharide-pneumococcal-vaccination reduction and significant decrease in the immune response to neoantigen [9-11].

In conclusion, rituximab and methotrexate on immune response of a SARS-CoV-2 (COVID-19) vaccine are to be investigated, yet. Two weeks of holding methotrexate and a few weeks of scheduling after the COVID-19 vaccination are considered until the questions are answered by the further clinical trials.

Conflicts of Interest

The authors declare that have no competing interest and not any conflict of interest.

References

1. Pfizer and BioNTech conclude phase 3 study of COVID-19 vaccine candidate, meeting all primary efficacy endpoints. Pfizer. [Last accessed on October 10, 2021] <https://www.pfizer.com/news/press-release/press-release-details/pfizer-and-biontech-conclude-phase-3-study-covid-19-vaccine>
2. Promising interim results from clinical trial of NIH-Moderna COVID-19 Vaccine. 2020. In: National Institutes of Health (NIH). [Last accessed on October 10, 2021] <https://www.nih.gov/news-events/news-releases/promising-interim-results-clinical-trial-nih-moderna-covid-19-vaccine>
3. Gianfrancesco M, Hyrich KL, Al-Adely S. Characteristics associated with hospitalization for COVID-19 Global Rheumatology Alliance physician-reported registry. *Ann Rheum Dis*. 2020;70:859-66.
4. Wolfe F, Mitchell DM, Sibley JT, Fries JF, Bloch DA, Williams CA, et al. The mortality of rheumatoid arthritis. *Arthritis Rheum*. 1994;37:481-94.
5. Sahin U, Muik A, Derhovanessian E, Vogler I, Kranz LM, Vormehr M, et al. COVID-19 vaccine BNT162b2 elicits human antibody and TH1 T-cell responses. *Nature*. 2020;586:594-9.
6. Jackson LA, Anderson EJ, Rouphael NG, Roberts PC, Makhene M, Coler RN, et al. mRNA-1273 Study Group. An mRNA vaccine against SARS-CoV-2-preliminary report. *N Engl J Med*. 2020;383:1920-31.
7. Subesinghe S, Beehman K, Rutherford AI, Goldblatt D, Galloway JB. A systematic review and meta-analysis of antirheumatic drugs and vaccine immunogenicity in rheumatoid arthritis. *J Rheumatol*. 2018;45:733-44.
8. Hua C, Barnette T, Combe B, Morel J. Effect of methotrexate, anti-tumor necrosis factor α , and rituximab on the immune response to influenza and pneumococcal vaccines in patients with rheumatoid arthritis : a systematic review and meta-analysis. *Arthritis Care Res (Hoboken)*. 2014;66:1016-26.
9. Park JK, Lee YJ, Bitoun S, Winthrop KL, Choi Y, Lee EB, et al. Interaction between B-cell activation factor and methotrexate impacts immunogenicity of seasonal influenza vaccination in patients with rheumatoid arthritis. *Ann Rheum Dis*. 2019;78:282-4.
10. Bingham CO, Looney RJ, Deodhar A. Immunization responses in rheumatoid arthritis patients treated with rituximab : results from a controlled clinical trial. *Arthritis Rheum*. 2010;62:64-74.
11. Park JK, Lee YJ, Shin K, Ha YJ, Lee EY, Song YW, et al. Impact of temporary methotrexate discontinuation for 2 weeks on immunogenicity of seasonal influenza vaccination in patients with rheumatoid arthritis : a randomized clinical trial. *Ann Rheum Dis*. 2018;77:898-904.

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