Received: 4 October 2022 | Accepted: 21 November 2022

DOI: 10.1111/jdv.18809

JEADV JOURNAL OF THE EUROPEAN ACADEMY OF DERMATOLOGY & VENEREOLOGY

LETTER TO THE EDITOR

Seroconversion and neutralizing antibodies production after completion of Pfizer-BioNTech BNT 162b2 vaccination scheme among psoriatic patients receiving biological or topical treatment: A prospective observational cohort study

To the Editor,

Vaccination during the COVID-19 pandemic was the most effective way to prevent the SARS-COV-2 spreading and to reduce its morbidity/mortality.[1] In order to evaluate the efficacy of vaccination on psoriatic patients receiving drugs potentially affecting immune system response, some studies have been performed.[2–8] However, such analyses only compared psoriatic patients with healthy controls. The aim of our study was to assess the rate of anti-SARS-CoV-2 neutralizing antibodies in psoriatic patients under topical and biological therapies after the completion of the first vaccination cycle with BNT162b2 vaccine and to verify whether there could be a difference between the different type of treatments. The determination of the neutralizing antibodies was conducted employing *Liaison Diasorin*, *Siemens Centaur* and *Cobas-Elecsys Roche*. The cut-off levels for these tests were 33.8 BAU/ml, 1 Index and 0.8 U/ml respectively, in accordance with the cut-off determined by the manufacturers. Levels of neutralizing antibodies were assessed at baseline (before the first dose of the vaccine—T1), 14 days after the first dose (T2) and 14 days after the second dose (T3).

Fifty-one patients, 36 male and 15 females, were initially enrolled. After T1, four patients (three males and one female) were excluded due to the detection of anti-SARS-CoV-2 antibodies. Were also excluded a female patient that changed the drug during the study, a female patient treated with IL23-inhibitors and another male patient treated with IL17-inhibitors that skipped blood sampling at T2 and T3, respectively. Forty-three patients, 32 males (74%) and 11 females (26%), were included for postvaccination analyses, with a mean age of 49 (±11) and a median age of 51 (IQR 40–56). Among them, nine of 43 received topical treatment, including corticosteroids and vitamin D analogues, nine of 43 TNFα-inhibitors (Adalimumab), nine of 43 IL17-inhibitors (Secukinumab) and 16 of 43 IL23-inhibitors (seven Risankizumab, eight Guselkumab and one Tildrakizumab). None of them presented SARS-CoV-2 antibodies at T1 sample. At T2, the rate of positivity of the test performed with *Siemens Centaur* assay turned out to be eight of nine (88.9%) for patients treated with topical treatments, six of nine (66.7%) for patients under TNFα-inhibitors, seven of nine (77.8%) for patients under IL17-inhibitors and 13 of 16 (81.3%) for patients under IL23-inhibitors; when analysed with *Cobas-Elecsys Roche* assay, the results were nine of nine (100%) for patients treated with topical treatments, eight of nine (88.9%) for patients under TNFα-inhibitors, nine of nine (100%) for patients under IL17-inhibitors and 13 of 16 (81.3%) for patients under IL23-inhibitors and when *Liaison Diasorin* assay was employed, the results were nine of nine (100%) for patients treated with topical treatments, seven of nine (77.8%) for patients under TNFα-inhibitors, 9/9 (100%) for patients under IL17-inhibitors and 14 of 16 (87.5%) for patients under IL23-inhibitors. Overall, at T2, no statistically significant difference was observed between all groups of treatment using the three measurement methods (*Siemens Centaur* analysis: $p = 0.841$; *Cobas-Elecsys Roche* analysis: $p = 0.417$; *Liaison Diasorin* analysis: $p = 0.295$). In terms of antibodies serum levels at T3, all the enrolled subjects showed a relevant increase rate of neutralizing antibodies, as assessed by all the three analysing methods. However, when considering the analysis conducted employing the *Cobas-Elecsys Roche* assay, we found a statistically significant difference ($p = 0.048$) in antibody levels at T3 between all patients. However, when applying Bonferroni correction between the groups, this significance is no longer observed.

Our analysis showed a significant efficacy of BNT162b2 vaccination in psoriatic patients under biological and topical therapies, with all the groups featuring a rate of antibody protection after the second dose of 100%. Although the antibody levels could show some quantitative fluctuation, the protection levels of humoral immune response would not be affected by the type of antipsoriatic therapy, with subjects treated with biological and topical agents being protected similarly.

ACKNOWLEDGEMENTS

None.

CONFLICT OF INTEREST

None.

DATA AVAILABILITY STATEMENT

Authors elect to not share data.

Giuseppe Stinco[1,2]
Enzo Errichetti[1,2]
Matteo Figini[2]
Alba Guglielmo[2]
Benedetta Fazzi[2]
Luca Quartuccio[1,3]
Alen Zabotti[3]
Salvatore De Vita[1,3]
Miriam Isola[1,4]
Maria De Martino[4]
Silvia Rossi[1]
Riccardo Lucis[1]
Martina Fabris[5]
Antonio Paolo Beltrami[1,5]
Francesco Curcio[1,5]
Federica D'Aurizio[5]

[1]*Department of Medicine (DAME), University of Udine, Udine, Italy*
[2]*Institute of Dermatology, Azienda Sanitaria Universitaria Friuli Centrale (ASUFC), Udine, Italy*
[3]*Rheumatology Clinic, Azienda Sanitaria Universitaria Friuli Centrale (ASUFC), Udine, Italy*
[4]*Division of Medical Statistics, University of Udine, Udine, Italy*
[5]*Institute of Clinical Pathology, Azienda Sanitaria Universitaria Friuli Centrale (ASUFC), Udine, Italy*

Correspondence
Alba Guglielmo, Institute of Dermatology, Azienda Sanitaria Universitaria Friuli Centrale (ASUFC), Udine, Italy; Dermatology, Department of Experimental, Diagnostic and Specialty Medicine, University of Bologna, Via Massarenti, 1 – 40138 Bologna, Italy.
Email: albaguglielmo@gmail.com

ORCID

Giuseppe Stinco https://orcid.org/0000-0002-2392-9504
Alba Guglielmo https://orcid.org/0000-0003-2827-409X
Alen Zabotti https://orcid.org/0000-0002-0573-464X

REFERENCES

1. Polack FP, Thomas SJ, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al. Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. N Engl J Med. 2020;383:2603–15.
2. Mahil SK, Bechman K, Raharja A, Domingo-Vila C, Baudry D, Brown MA, et al. The effect of methotrexate and targeted immunosuppression on humoral and cellular immune responses to the COVID-19 vaccine BNT162b2: a cohort study. Lancet Rheumatol. 2021;3:e627–37.
3. Venerito V, Stefanizzi P, Fornaro M, Cacciapaglia F, Tafuri S, Perniola S, et al. Immunogenicity of BNT162b2 mRNA SARS-CoV-2 vaccine in patients with psoriatic arthritis on TNF inhibitors. RMD Open. 2022;8:e001847.
4. Piros ÉA, Cseprekál O, Görög A, Hidvégi B, Medvecz M, Szabó Z, et al. Seroconversion after anti-SARS-CoV-2 mRNA vaccinations among moderate-to-severe psoriatic patients receiving systemic biologicals – prospective observational cohort study. Dermatol Ther. 2022;26:e15408.
5. Angyal A, Longet S, Moore S, Payne RP, Harding A, Tipton T, et al. T-cell and antibody responses to first BNT162b2 vaccine dose in previously SARS-CoV-2-infected and infection-naive UK healthcare workers: a multicentre, prospective, observational cohort study. Lancet Microbe. 2022;3:e21–31. https://doi.org/10.2139/ssrn.3812375
6. Geisen UM, Berner DK, Tran F, Sümbül M, Vullriede L, Ciripoi M, et al. Immunogenicity and safety of anti-SARS-CoV-2 mRNA vaccines in patients with chronic inflammatory conditions and immunosuppressive therapy in a monocentric cohort. Ann Rheum Dis. 2021;80:1306–11.
7. Al-Janabi A, Littlewood Z, Griffiths CEM, Hunter HJA, Chinoy H, Moriarty C, et al. Antibody responses to single-dose SARS-CoV-2 vaccination in patients receiving immunomodulators for immune-mediated inflammatory disease. Br J Dermatol. 2021;185:646–8.
8. Chiricozzi A, Gisondi P, Bellinato F, Girolomoni G. Immune response to vaccination in patients with psoriasis treated with systemic therapies. Vaccines (Basel). 2020;8:769.