

LETTERS TO THE EDITOR

Newly-developed vitiligo following COVID-19 mRNA vaccine

Dear Editor,

Today, COVID-19 vaccines are the most important tools for pandemic control and prevention, but vaccines are also known to be potential triggers of autoimmune reactions.¹ COVID-19 vaccines can create an imbalance in cytokine pathways that play a vital role in autoinflammation and autoimmunity by stimulating dendritic cells. Herein, we report newly-developed vitiligo following COVID-19 mRNA vaccination.

A 47-year-old male patient presented to our clinic with white macules started 1 week after the first dose of Pfizer-BioNTech vaccine BNT162b2 (Comirnaty®). At the time between first and second doses of vaccination, these macules progressed in size and he developed new macules rapidly. After second dose, the rate of progression slowed down. On dermatological examination, there were depigmented white patches on the bilateral axilla and forearm flexor surfaces (Figure 1A). He had a history of ankylosing spondylitis for nearly 40 years. He had used sulfasalazine before but had not

received any treatment for 4 years. Based on Wood's lamp examination, depigmented areas were diagnosed as vitiligo (Figure 1B). He had no previous history of vitiligo. Topical pimecrolimus was applied twice daily as treatment. During the follow-up 1 month later, slight repigmentation was observed on depigmented macules (Figure 1C).

Vaccine-related cutaneous adverse effects have been reported with the widespread use of COVID-19 mRNA vaccines. They are usually mild and self-limited. Local injection site reactions, urticaria, morbiliform eruptions, erythromelalgia, pernio/chillblain, filler reactions, and pityriasis rosea-like eruptions, are among the reported side effects.² The first case of vitiligo reported with COVID-19 mRNA vaccine was observed in a 58-year-old patient with ulcerative colitis characterized by white macules on the face 1 week after the first dose of vaccine (Comirnaty®).³ Another case reported 3 days after the COVID-19 mRNA vaccine (Moderna) was observed in a 61-year-old patient with no history of comorbid disease.⁴ Third case of vitiligo with COVID-19 mRNA vaccine was also

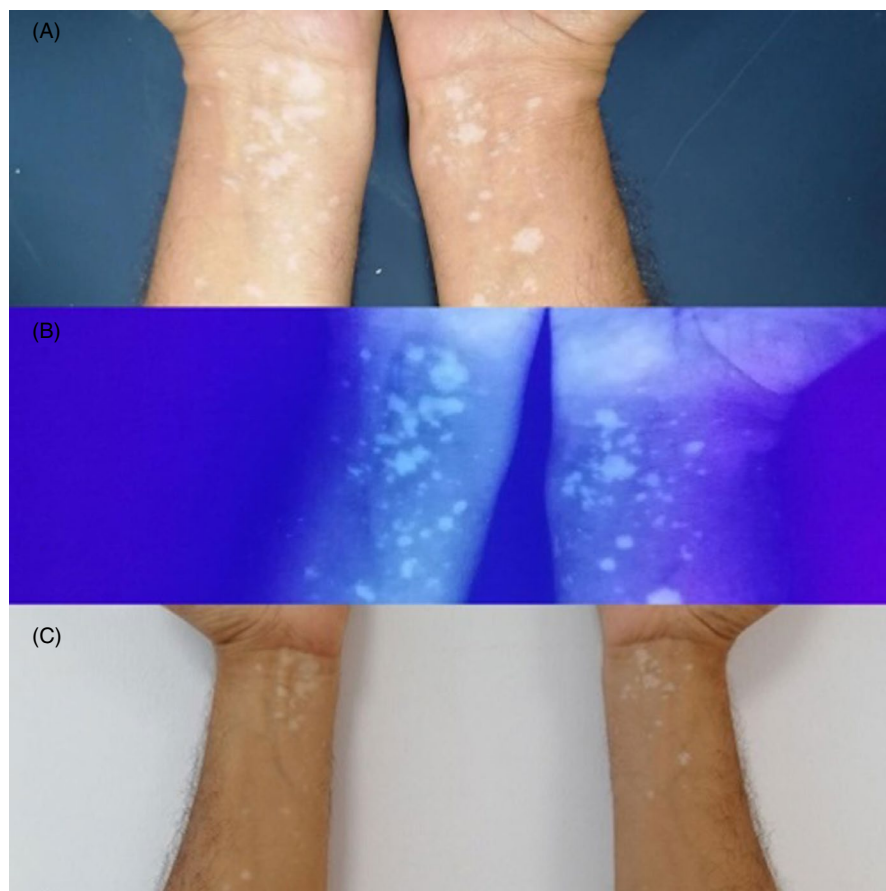


FIGURE 1 (A) Newly-developed vitiligo after COVID-19 mRNA vaccine. (B) Wood's lamp examination of white macules. (C) Slight repigmentation on depigmented white macules

with Pfizer-Biontech vaccine in a 33-year-old female patient who had unremarkable medical history.⁵ All patients reported no personal nor family history of vitiligo. It is not clear that vitiligo was caused by vaccination, but the temporal relationship between the disease development and vaccination is interesting in all cases. While there are 3 reported cases of COVID-19 mRNA vaccine-induced vitiligo, only one case of vitiligo was reported with vector-based vaccine in clinical trial⁶ and one case of vitiligo was reported with inactivated vaccine.⁷ Vaccines can trigger several autoimmune diseases in people with a genetic susceptibility. Several autoimmune diseases, including multiple sclerosis, immune thrombocytopenic purpura, and systemic lupus erythematosus have been linked to vaccines such as influenza, hepatitis B, and the measles/mumps/rubella vaccines.¹ The mode of action varies among the different vaccine types, but it leads to increased expression of interferons, which are a prerequisite for sufficient antiviral immunogenicity. Type 1 interferons (IFN-1) and plasmacytoid dendritic cells (pDC) may be the possible link for the association between vitiligo and COVID-19 mRNA vaccines. Coronaviruses strongly induce IFN-1 production by stimulating plasmacytoid dendritic cells.⁸ mRNA vaccines incite immunity to COVID-19 by producing high spike-protein levels, and also they induce IFN-1 production through pDC-mediated immune response.⁹ IFN-I production and pDC recruitment is an early step also in vitiligo pathogenesis. Furthermore, vitiligo and vitiligo-like hypopigmentation in patients receiving IFN-alpha treatment supports these findings.¹⁰

Although the mechanisms are not clear, it is important for clinicians to identify and report the cutaneous side effects of new mRNA vaccines. Further studies are needed to explain the causal relationship between new mRNA vaccines and vitiligo. Patients need to be encouraged to continue receiving COVID vaccination while clinicians should be aware of possible autoimmune cutaneous side effects.

ACKNOWLEDGEMENT

All patients signed consents to the publication.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

ETHICAL APPROVAL STATEMENT

Authors declare human ethics approval was not needed for this study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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REFERENCES

1. Vadalà M, Poddighe D, Laurino C, Palmieri B. Vaccination and autoimmune diseases: is prevention of adverse health effects on the horizon? *EPMA J.* 2017;8(3):295-311.
2. McMahon DE, Amerson E, Rosenbach M, et al. Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: a registry-based study of 414 cases. *J Am Acad Dermatol.* 2021;85(1):46-55.
3. Aktas H, Ertugrul G. Vitiligo in a COVID-19-vaccinated patient with ulcerative colitis: coincidence? *Clin Exp Dermatol.* 2022;47(1):143-144.
4. Kaminetsky J, Rudikoff D. New-onset vitiligo following mRNA-1273 (Moderna) COVID-19 vaccination. *Clinical Case Reports.* 2021;9(9):e04865.
5. Ciccarese G, Drago F, Boldrin S, Pattaro M, Parodi A. Sudden onset of vitiligo after COVID-19 vaccine. *Dermatol Ther.* 2022;35:e15196-e15196.
6. Voysey M, Clemens SAC, Madhi SA, et al. Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *The Lancet.* 2021;397(10269):99-111.
7. Koç YS. A new-onset vitiligo following the inactivated COVID-19 vaccine. *J Cosmet Dermatol.* 21:429-430.
8. Onodi F, Bonnet-Madin L, Meertens L, et al. SARS-CoV-2 induces human plasmacytoid predendritic cell diversification via UNC93B and IRAK4. *J Exp Med.* 2021;218(4):e20201387.
9. Teijaro JR, Farber DL. COVID-19 vaccines: modes of immune activation and future challenges. *Nat Rev Immunol.* 2021;21(4):195-197.
10. Bertolotti A, Boniface K, Vergier B, et al. Type I interferon signature in the initiation of the immune response in vitiligo. *Pigment Cell & Melanoma Research.* 2014;27(3):398-407.

How to cite this article: Uğur E, Sivaz O, Kıvanç Altunay İ. Newly-developed vitiligo following COVID-19 mRNA vaccine. *J Cosmet Dermatol.* 2022;21:1350-1351. doi:[10.1111/jocd.14843](https://doi.org/10.1111/jocd.14843)