Adverse Effects of the COVID-19 Vaccine in Patients With Psoriasis

Leah Shin, BA; Shahin Shahsavari, BA; Claudia Lee, BS; Jennifer Laborada, BS; Alexander Egeberg, MD, PhD, DMSc; Jashin J. Wu, MD

PRACTICE **POINTS**

- Patients who have psoriasis do not appear to have an increased incidence of adverse effects from messenger RNA COVID-19 vaccines.
- Clinicians can safely recommend COVID-19 vaccines to patients who have psoriasis.

To the Editor:

Because the SARS-CoV-2 virus is constantly changing, routine vaccination to prevent COVID-19 infection is recommended. The messenger RNA (mRNA) vaccines from Pfizer-BioNTech and Moderna as well as the Ad26.COV2.S (Johnson & Johnson) and NVX-CoV2373 (Novavax) vaccines are the most commonly used COVID-19 vaccines in the United States. Adverse effects following vaccination against SARS-CoV-2 are well documented; recent studies report a small incidence of adverse effects in the general population, with most being minor (eg, headache, fever, muscle pain).[1,2] Interestingly, reports of exacerbation of psoriasis and new-onset psoriasis following COVID-19 vaccination suggest a potential association.[3,4] However, the literature investigating the vaccine adverse effect profile in this demographic is scarce. We examined the incidence of adverse effects from SARS-CoV-2 vaccines in patients with psoriasis.

This retrospective cohort study used the COVID-19 Research Database (https://covid19researchdatabase.org/) to examine the adverse effects following the first and second doses of the mRNA vaccines in patients with and without psoriasis. The sample size for the Ad26.COV2.S vaccine was too small to analyze.

Claims were evaluated from August to October 2021 for 2 diagnoses of psoriasis prior to January 1, 2020, using the *International Classification of Diseases, Tenth Revision* (*ICD-10*) code L40.9 to increase the positive predictive value and ensure that the diagnosis preceded the COVID-19 pandemic. Patients younger than 18 years and those who did not receive 2 doses of a SARS-CoV-2 vaccine were excluded. Controls who did not have a diagnosis of psoriasis were matched for age, sex, and hypertension at a 4:1 ratio. Hypertension represented the most

Ms. Shin is from Loma Linda University School of Medicine, California. Mr. Shahsavari is from Geisel School of Medicine, Hanover, New Hampshire. Ms. Lee and Ms. Laborada are from University of California Riverside School of Medicine, Riverside. Dr. Egeberg is from the Department of Dermatology, Bispebjerg Hospital, Copenhagen, Denmark. Dr. Wu is from the Dr. Phillip Frost Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, Florida.

Ms. Shin, Mr. Shahsavari, Ms. Lee, Ms. Laborada, and Dr. Egeberg report no conflict of interest. Dr. Wu is or has been an investigator, consultant, or speaker for AbbVie, Almirall, Amgen, Arcutis, Aristea Therapeutics, Bausch Health, Boehringer Ingelheim, Bristol Myers Squibb, Codex Labs, Dermavant, DermTech, Dr. Reddy's Laboratories, Eli Lilly and Company, EPI Health, Galderma, Janssen Pharmaceuticals, LEO Pharma, Mindera, Novartis, Regeneron, Samsung Bioepis, Sanofi Genzyme, Solius, Sun Pharmaceutical Industries Ltd, UCB, and Zerigo Health. He also has received research grants from AbbVie, Amgen, Eli Lilly and Company, Janssen Pharmaceuticals, Novartis, and Pfizer Inc.

The eTable is available in the Appendix online at www.mdedge.com/dermatology.

Correspondence: Jashin J. Wu, MD, University of Miami Miller School of Medicine, 1600 NW 10th Ave, RMSB, Room 2023-A, Miami, FL 33136 (jashinwu@hotmail.com).

doi:10.12788/cutis.0700

Characteristics of Psoriasis Patients and Matched Controls

Characteristic	Psoriasis group (n=4273)	Control group (n=17,092)
Mean age (SD), y	63.3 (15.4)	63.3 (15.4)
Sex, n (%)		
Male	2028 (47.5)	8112 (47.5)
Female	2245 (52.5)	8980 (52.5)
Comorbidities, n (%)		
Asthma	469 (11.0)	939 (5.5)
Chronic ischemic heart disease	597 (14.0)	1558 (9.1)
Chronic kidney disease	587 (13.7)	1749 (10.2)
Chronic obstructive pulmonary disease	360 (8.4)	856 (5.0)
Congestive heart failure	319 (7.5)	858 (5.0)
Essential hypertension	2286 (53.5)	8856 (51.8)
Overweight or obese	999 (23.4)	2484 (14.5)
Rhinitis	642 (15.0)	1475 (8.6)
Type 2 diabetes mellitus	1190 (27.8)	3883 (22.7)
SARS-CoV-2 vaccines, n (%)		
Moderna	2931 (68.6)	11,724 (68.6)
Pfizer-BioNTech	1342 (31.4)	5368 (31.4)

common comorbidity that could feasibly be controlled for in this study population. Other comorbidities recorded included obesity, type 2 diabetes mellitus, congestive heart failure, asthma, chronic obstructive pulmonary disease, chronic ischemic heart disease, rhinitis, and chronic kidney disease.

Common adverse effects as long as 30 days after vaccination were identified using *ICD-10* codes. Adverse effects of interest were anaphylactic reaction, initial encounter of adverse effect of viral vaccines, fever, allergic urticaria, weakness, altered mental status, malaise, allergic reaction, chest pain, symptoms involving circulatory or respiratory systems, localized rash, axillary lymphadenopathy, infection, and myocarditis.[5] Poisson regression was performed using Stata 17 analytical software.

We identified 4273 patients with psoriasis and 17,092 controls who received mRNA COVID-19 vaccines (Table). Adjusted odds ratios (aORs) for doses 1 and 2 were calculated for each vaccine (eTable). Adverse effects with sufficient data to generate an aOR included weakness, altered mental status, malaise, chest pain, and symptoms involving the circulatory or respiratory system. The aORs for allergic urticaria and initial encounter of adverse effect of viral vaccines were only calculated for the Moderna mRNA vaccine due to low sample size.

This study demonstrated that patients with psoriasis do not appear to have a significantly increased risk of adverse effects from mRNA SARS-CoV-2 vaccines. Although the ORs in this study were not significant, most recorded adverse effects demonstrated an aOR less than 1, suggesting that there might be a lower risk of certain adverse effects in psoriasis patients. This could be explained by the immunomodulatory effects of certain systemic psoriasis treatments that might influence the adverse effect presentation.

The study is limited by the lack of treatment data, small sample size, and the fact that it did not assess flares or worsening of psoriasis with the vaccines. Underreporting of adverse effects by patients and underdiagnosis of adverse effects secondary to SARS-CoV-2 vaccines due to its novel nature, incompletely understood consequences, and limited *ICD-10* codes associated with adverse effects all contributed to the small sample size.

Our findings suggest that the risk for immediate adverse effects from the mRNA SARS-CoV-2 vaccines is not increased among psoriasis patients. However, the impact of immunomodulatory agents on vaccine efficacy and expected adverse effects should be investigated. As more individuals receive the COVID-19 vaccine, the adverse effect profile in patients with psoriasis is an important area of investigation.

REFERENCES

1. Singh A, Khillan R, Mishra Y, et al. The safety profile of COVID-19 vaccinations in the United States. *Am J Infect Control*. 2022;50:15-19. doi: 10.1016/j.ajic.2021.10.015
2. Beatty AL, Peyser ND, Butcher XE, et al. Analysis of COVID-19 vaccine type and adverse effects following vaccination. *JAMA Netw Open*. 2021;4:e2140364. doi:10.1001/jamanetworkopen.2021.40364
3. Bellinato F, Maurelli M, Gisondi P, et al. Cutaneous adverse reactions associated with SARS-CoV-2 vaccines. *J Clin Med*. 2021;10:5344. doi:10.3390/jcm10225344
4. Elamin S, Hinds F, Tolland J. De novo generalized pustular psoriasis following Oxford-AstraZeneca COVID-19 vaccine. *Clin Exp Dermatol*. 2022;47:153-155. doi:10.1111/ced.14895
5. Remer EE. Coding COVID-19 vaccination. *ICD10monitor*. Published March 2, 2021. Updated October 18, 2022. Accessed January 17, 2023. https://icd10monitor.medlearn.com/coding-covid-19-vaccination/

APPENDIX

eTABLE. Frequencies and Adjusted Odds Ratios for Adverse Effects of Moderna and Pfizer-BioNTech COVID-19 Vaccines in Patients With and Without Psoriasis

Adverse effect (*ICD-10* code)	Frequency in psoriasis group, n (%)(n=4273)	Frequency in control group, n (%)(n=17,092)	Moderna aOR (95% CI)	Pfizer-BioNTech aOR (95% CI)
Adverse effect of viral vaccines, initial encounter (T50.B95A)	Total: 2 (0.05)	Total: 4 (0.02)		
Dose 1	1 (0.02)	2 (0.01)	0.66 (−1.9 to 3.01)	N/A
Dose 2	1 (0.02)	2 (0.01)	0.63 (−1.84 to 3.05)	N/A
Allergic urticaria (L50.0)	Total: 5 (0.12)	Total: 6 (0.04)		
Dose 1	2 (0.05)	1 (0.01)	0.12 (−0.5 to 4.37)	N/A
Dose 2	3 (0.07)	5 (0.03)	0.17 (−0.45 to 2.58)	N/A
Altered mental status (R41.82)	Total: 22 (0.51)	Total: 64 (0.37)		
Dose 1	3 (0.07)	13 (0.08)	0.61 (−1.92 to 1.12)	0.77 (−2.1 to 2.82)
Dose 2	19 (0.44)	51 (0.30)	0.19 (−0.19 to 0.98)	0.77 (−1.48 to 1.1)
Chest pain (R07.89)	Total: 91 (2.13)	Total: 291 (1.7)		
Dose 1	16 (0.37)	65 (0.38)	0.73 (−0.76 to 0.53)	0.52 (−1.43 to 0.73)
Dose 2	75 (1.76)	226 (1.32)	0.33 (−0.16 to 0.48)	0.78 (−0.4 to 0.54)
Malaise (R53.81)	Total: 17 (0.40)	Total: 47 (0.27)		
Dose 1	1 (0.02)	8 (0.05)	1 (−5516 to 5482)	N/A
Dose 2	16 (0.37)	39 (0.23)	0.08 (−0.08 to 1.24)	0.36 (−2.24 to 0.81)
Symptoms involving the circulatory or respiratory system (R09.89)	Total: 20 (0.47)	Total: 76 (0.44)		
Dose 1	4 (0.09)	17 (0.10)	0.65 (−1.56 to 0.98)	0.94 (−2.3 to 2.13)
Dose 2	16 (0.37)	59 (0.35)	0.93 (−0.63 to 0.58)	0.55 (−1.99 to 1.06)
Weakness (R53.1)	Total: 66 (1.54)	Total: 183 (1.07)		
Dose 1	11 (0.26)	35 (0.20)	0.49 (−0.51 to 1.07)	0.37 (−2.19 to 0.81)
Dose 2	55 (1.29)	148 (0.87)	0.2 (−0.13 to 0.63)	0.3 (−0.27 to 0.86)

Abbreviations: aOR, adjusted odds ratio; *ICD-10, International Classification of Diseases, Tenth Revision*; N/A, not applicable.