Received: 11 July 2022 | Accepted: 27 July 2022

DOI: 10.1111/jdv.18491

LETTER TO THE EDITOR

Alopecia areata after COVID-19 infection and vaccination: A cross-sectional analysis

Dear Editor,

Concerns about alopecia areata (AA) occurring after coronavirus disease 2019 (COVID-19) infection and vaccination have recently emerged, but current data are sparse and mostly limited to case reports. We conducted an online questionnaire among patients with AA to better understand the relationship between AA and COVID-19.

Members of AA online support groups (e.g. 'Alopecia areata, find a cure') on social media were invited to participate in a questionnaire. Individuals were eligible to participate if they had been diagnosed with AA and tested positive for COVID-19 or received at least one COVID-19 vaccination. This study was approved by the University of Miami Institutional Review Board.

Of 214 members who were eligible and invited to participate, 152 (71.0%) members agreed to complete the questionnaire and 131 (61.2%) members (mean age 41.6 years, 87.8% female) returned a completed questionnaire (Table 1). Of 59 respondents who tested positive for COVID-19, 25 (42.4%) reported AA symptoms after infection: 60.0% (15/25) had a new diagnosis of AA, and 36.0% (9/25) experienced relapse of pre-existing AA (Table 2). Of 113 respondents who received at least one COVID-19 vaccination, 77 (68.1%) reported AA symptoms after vaccination: 50.6% (39/77) had a new diagnosis of AA, and 49.4% (38/77) experienced relapse of pre-existing AA. The three most commonly implicated vaccines were manufactured by Pfizer (65/109, 59.6%), Moderna (22/109, 20.2%) and Oxford-AstraZeneca (13/109, 11.9%). Where reported, more patients developed symptoms of AA after the second COVID-19 vaccination (25/47, 53.2%) than the first vaccination (12/47, 25.5%) or third vaccination (10/47, 21.3%). On average, symptoms of AA occurred 50.6 days after COVID-19 infection and 61.5 days after COVID-19 vaccination. Where reported, the most commonly utilized treatments at the time of questionnaire were corticosteroid injections (20/48, 41.7%), topical corticosteroids (18/48, 37.5%), topical or oral minoxidil (11/48, 22.9%), oral Janus kinase (JAK) inhibitors (5/48, 10.4%), oral corticosteroids (4/48, 8.3%) and topical JAK inhibitors (3/48, 6.3%) (Table 1).

Collectively, our findings suggest that, while rare, symptoms of AA may develop after COVID-19 infection or vaccination in certain individuals. The mechanism of this potential association is unclear but may involve upregulation of pro-inflammatory cytokines such as interleukin (IL)-6, tumour necrosis factor (TNF)-α and IFN-ɣ that are also implicated in AA pathogenesis.[1] Psychologic stress from the COVID-19 pandemic may also trigger or exacerbate AA.[2] Despite increasing reports of AA after COVID-19 infection,[3] one recent cohort study of 226,737 individuals concluded that diagnosis of COVID-19 was not significantly associated with development of AA.[4]

As of May 20, 2022, 143 cases of AA occurring after COVID-19 vaccination have been reported to the Center

TABLE 1 Demographics of respondents with alopecia areata after COVID-19 infection or vaccination

Percentage of completed questionnaires (n = 131)	131/214 (61.2%)
Mean age of respondents (SD) (years)	41.6 (14.8)
Mean age at diagnosis of AA (SD) (years)	33.5 (12.2)
Female	115/131 (87.8%)
Ethnicity	
White	93/131 (71.0%)
Asian	12/131 (9.2%)
Hispanic or Latino	7/131 (5.3%)
Black or African American	3/131 (2.3%)
Native Hawaiian or Other Pacific Islander	1/131 (0.7%)
Two or More or Other	12/131 (9.2%)
Prefer not to say	3/131 (2.3%)
Treatments utilized, where reported (n = 48)[a]	
Corticosteroid injection	20/48 (41.7%)
Topical corticosteroid	18/48 (37.5%)
Oral corticosteroid	4/48 (8.3%)
Corticosteroid (unspecified mode of delivery)	1/48 (2.1%)
Oral or topical minoxidil	11/48 (22.9%)
Oral JAK inhibitor	5/48 (10.4%)
Topical JAK inhibitor	3/48 (6.3%)
JAK inhibitor (unspecified mode of delivery)	1/48 (2.1%)
Oral antihistamine	1/48 (2.1%)
Mycophenolate mofetil injection	1/48 (2.1%)
Oral hydroxychloroquine	1/48 (2.1%)
No treatment	2/48 (4.2%)

Abbreviations: AA, alopecia areata; JAK, Janus kinase; SD, standard deviation.
[a]Participants were able to specify more than one treatment.

TABLE 2 Characteristics and timing to onset of alopecia areata after COVID-19 infection and vaccination

Individuals who had COVID-19 infection (n = 59)	59/131 (45.0%)
Symptoms of AA after COVID-19 infection (n = 25)	25/59 (42.4%)
New onset diagnosis of AA	15/25 (60.0%)
Relapse of pre-existing AA	9/25 (36.0%)
Declined to specify	1/25 (4.0%)
Timing of AA symptoms, where specified (n = 22)	
Mean (SD) days to onset of AA symptoms	50.6 (31.7)
Individuals who had COVID-19 vaccination (n = 113)	113/131 (86.3%)
Symptoms of AA after COVID-19 vaccination (n = 77)	77/113 (68.1%)
New onset diagnosis of AA	39/77 (50.6%)
Relapse of pre-existing AA	38/77 (49.4%)
Manufacturer of first COVID-19 vaccination (n = 113)	
Pfizer	65/113 (57.0%)
Moderna	22/113 (19.3%)
AstraZeneca	13/113 (11.4%)
Johnson & Johnson	8/113 (7.0%)
Sinovac	1/113 (0.9%)
Other/Declined to specify	4/113 (3.5%)
Timing of AA symptoms, where reported (n = 47)	
Mean (SD) days to onset of AA symptoms	61.5 (72.7)
After first COVID-19 vaccination	12/47 (25.5%)
After second COVID-19 vaccination	25/47 (53.2%)
After third COVID-19 vaccination	10/47 (21.3%)

Abbreviations: AAA, alopecia areata; SD, standard deviation.

for Disease Control and Prevention's Vaccine Adverse Event Reporting System.[5] Given this relatively small number of cases compared to the total vaccinated population, we believe that benefits of COVID-19 vaccination significantly outweigh potential risks. Our sentiment is shared by the National Alopecia Areata Foundation, which recommends that all AA patients with no known allergies to vaccine components receive the COVID-19 vaccine.[6]

Because our data are derived from patient-reported information from online support groups, our study has several limitations, including response and sampling bias. In addition, data on patient comorbidities and clinical outcomes were not collected, limiting conclusions that can be drawn from this data. Moreover, because AA is characterized by relapsing and remitting symptoms, reports of AA relapse after COVID-19 infection and vaccination may be coincidental in certain respondents. Further studies are needed to better understand the relationship between AA and COVID-19.

FUNDING INFORMATION
None.

CONFLICT OF INTEREST
Antonella Tosti is an investigator for Eli Lilly, Pfizer and Erchonia and a consultant for DS Laboratories, Monat Global, Almirall, Thirty Madison, Eli Lilly, Bristol Myers Squibb, P&G, Pfizer and Myovant. Betty Nguyen has no conflicts to declare.

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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