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LETTER

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Immunosuppressive therapies for alopecia areata during COVID-19: A cross-sectional survey study

Recent studies have demonstrated the safety of dermatologic immunosuppressive therapy during the COVID-19 pandemic.[1,2] These studies, however, have focused on immunosuppression in psoriasis, a disease with cardiometabolic and renal comorbidities.[3] No studies have examined immunosuppressive therapy during COVID-19 in those with alopecia areata (AA).

In this cross-sectional survey study, we evaluated the effect of AA immunosuppressive therapy on COVID-19 infection as well as the effects of the COVID-19 pandemic on AA treatment regimens and medication access.

An email survey was distributed in July 2020 to the National Alopecia Areata Foundation (NAAF) constituents and to AA patients at the Massachusetts General Hospital (MGH) hair loss clinic. Participants at least 18 years old with diagnosis of AA, alopecia totalis (AT), or alopecia universalis (AU) were eligible.

NAAF constituents and MGH patients opened 10 079 total emails, and 1452 (14.4%) accessed the survey link. Of those, 673 completed surveys (46.3%) between July 27 and August 5, 2020. Eight were excluded due to lack of relevant diagnosis or for non-AA-indicated immunosuppression. Respondents were grouped

TABLE 1 Patient demographics, immunosuppressive regimens, and COVID-19 infection prevalence among alopecia areata patients with and without immunosuppressive therapy

Category	ALL patients (N = 665)		Immunosuppressed (N = 58)		Not immunosuppressed (N = 607)		*P* value[a]
Age, mean ± SD	44.0 ± 15.8		44.2 ± 15.7		43.9 ± 15.9		.892
Sex, n (%)							
Female	553	83.2%	52	89.7%	501	82.5%	.166
Male	112	16.8%	6	10.3%	106	17.5%	.166
Race, n (%)							
American Indian or Alaska Native	6	0.9%	1	1.7%	5	0.8%	.488
Asian or Pacific Islander	43	6.5%	2	3.4%	41	6.8%	.328
Black or African American	63	9.5%	2	3.4%	61	10.0%	.101
Middle Eastern or North African	11	1.7%	4	6.9%	7	1.2%	**.001**
White	514	77.3%	46	79.3%	468	77.1%	.701
Other	28	4.2%	3	5.2%	25	4.1%	.703
Ethnicity, n (%)							
Hispanic or Latino	69	10.4%	3	5.2%	66	10.9%	.174
Not Hispanic or Latino	596	89.6%	55	94.8%	541	89.1%	.174
Alopecia diagnoses, n (%)							
Alopecia areata	352	52.9%	21	36.2%	324	53.4%	**.012**
Alopecia totalis	39	5.9%	3	5.2%	36	5.9%	.814
Alopecia universalis	166	25.0%	17	29.3%	149	24.5%	.423
Multiple AA diagnoses	108	16.2%	17	29.3%	91	15.0%	**.000**
Immunosuppressive medication							
All classes	58	8.7%	58	100.0%	0	0.0%	
Biologics	31	4.7%	31	53.4%			
JAK-inhibitor	30	4.5%	30	51.7%			
IL-4/IL-13 inhibitor	1	0.2%	1	1.7%			

(Continues)

TABLE 1 (Continued)

Category	ALL patients (N = 665)		Immunosuppressed (N = 58)		Not immunosuppressed (N = 607)		*P* value[a]
Traditional immunosuppressants	8	1.2%	8	13.8%			
Methotrexate	7	1.1%	7	12.1%			
Cyclosporine	1	0.2%	1	1.7%			
Azathioprine	0	0.0%	0	0.0%			
Systemic corticosteroids	10	1.5%	10	17.2%			
Combination therapy[b]	9	1.4%	9	15.5%			
COVID-19 testing, n (%)	n	%	n	%	n	%	
Total Tested	138	20.8%	17	29.3%	121	19.9%	.093
Total Positive Tests	7	1.1%	1	1.7%	6	1.0%	.600

[a]*P*-values represent student *t*-tests or χ^2-tests of independence between immunosuppressed vs. not immunosuppressed status and a given parameter. *P*-values are statistically significant at a threshold of 5%. Statistically significant *P*-values are bolded.
[b]Combination therapies included systemic corticosteroid together with traditional immunosuppressant or a biologic.

TABLE 2 Factors influencing COVID-19 infection and severity risk among alopecia areata patients with and without immunosuppressive therapy

Category	ALL patients (N = 665)		Immunosuppressed (N = 58)		Not immunosuppressed (N = 607)		*P* value[a]
Location of residence							
Country, n (%)							
United States	571	85.7%	52	88.1%	263	43.3%	**.000**
United Kingdom	16	2.4%	0	0.0%	5	0.8%	.488
Canada	16	2.4%	1	1.7%	6	1.0%	.600
India	10	1.5%	0	0.0%	3	0.5%	.592
Other	52	7.8%	5	8.5%	330	54.4%	**.000**
Most common US states, n (%)							
California	66	11.5%	9	17.0%	57	11.0%	.113
Massachusetts	51	8.9%	5	9.4%	46	8.9%	.644
New York	48	8.4%	4	7.5%	44	8.5%	.905
Texas	36	6.3%	3	5.7%	33	6.4%	.727
Florida	25	4.4%	1	1.9%	24	4.6%	.778
Most common underlying conditions, n (%)							
Asthma	131	19.7%	14	24.1%	117	19.3%	.374
Emphysema or COPD	5	0.8%	0	0.0%	5	0.8%	.488
Organ transplant or BMT	2	0.3%	1	1.7%	1	0.2%	**.038**
Diabetes	23	3.5%	0	0.0%	23	3.8%	.131
Current tobacco use	34	5.1%	4	6.9%	30	4.9%	.519
Rheumatoid arthritis	23	3.5%	7	12.1%	16	2.6%	**.000**
COVID-19 exposure risks, n (%)							
Known exposure to COVID-19	65	9.8%	3	5%	62	10.2%	.217
Chemotherapy since December 2019	3	0.5%	1	2%	2	0.3%	.130
Frequent exposures to COVID-19 patients	38	5.7%	2	3%	36	5.9%	.436
Regular cigarette/marijuana use	61	9.2%	4	7%	57	9.4%	.530
Travel outside the United States since December 2019	62	9.3%	7	12%	55	9.1%	.452
Essential worker status	262	39.4%	19	33%	243	40.0%	.279
Physically leaves home for work	278	41.8%	26	45%	252	41.5%	.625

[a]*P*-values represent χ^2-tests of independence between immunosuppressed vs not immunosuppressed status and a given parameter. *P*-values are statistically significant at a threshold of 5%. Statistically significant *P*-values are bolded.

by systemic immunosuppressive treatment (8.7%) and non-immunosuppressive treatment (91.3%). The most common immunosuppressive classes were Janus-kinase (JAK) inhibitors (51.7%) and systemic corticosteroids (17.2%) (Table 1). Demographics were largely similar between groups (Table 1).

Both groups had similar COVID-19 exposure risks (Table 2). There were no significant differences in COVID-19 testing (P = .093), positive results (P = .600) (Table 1), or hospitalization (P = .273) between groups. No respondents required supplemental oxygen, intensive care unit (ICU) admission or treatment with hydroxychloroquine, azithromycin, dexamethasone, or remdesivir.

Our study did not identify a significant relationship between AA immunosuppressive therapy and COVID-19 infection risk (Table 1) or severity. As of August 2020, 20.6% of the United States population had tested positive for COVID-19. The prevalence of COVID-19 in the top five states where study participants lived ranged from 1.5% to 2.6%.[4] Positive test prevalence was within or below this range for both immunosuppressive (1.7%) and nonimmunosuppressive (1.0%) groups.

Our data aligns with similar studies[1,2] suggesting immunosuppressive therapies do not significantly impact COVID-19 prevalence. Our results, therefore, support dermatologists continuing AA immunosuppressive therapies during COVID-19 while providing education to AA patients about COVID-19 risk mitigation.

While AA immunosuppressive therapy did not affect COVID-19 risk in participants, COVID-19 did impact alopecia treatment. During COVID-19 7.5% of all participants changed or stopped a medication, most commonly their scalp corticosteroid injections due to clinic closure or clinic avoidance as a personal risk mitigation during the pandemic (Table 3). Significantly more of the immunosuppressive group changed or stopped medication due to COVID-19 (17.2%) compared with the nonimmunosuppressive group (6.6%) (P = .003). In the immunosuppressive group, 10.3% stopped a medication, primarily due to immunosuppression concern during COVID-19 (66.7%). About 32.2% of participants believed their alopecia had worsened during COVID-19 with 17.0% listing COVID-19-related treatment changes as a cause.

Dermatologists should be aware of how COVID-19 may affect management of AA patients, primarily due to clinic closures and immunosuppression concerns. They can expect many patients returning to clinics with true or perceived hair loss progression resulting from months of interrupted treatment, with patients on immunosuppressive therapies most affected. Patients should be counseled about the relative reported safety of the commonly used AA immunosuppressive therapies during COVID-19 and of continuing therapy to limit AA disease progression.

Our study is limited by patient-reported data and small number of COVID-19-positive patients available for statistical analysis.

TABLE 3 COVID-19 effects on hair loss and alopecia areata disease management among patients with and without immunosuppressive therapy

Category	All patients (N = 665)		Immunosuppressed (N = 58)		Not immunosuppressed (N = 607)		P values[a]
Perceived hair loss due to COVID-19, n (%)							
Worsened hair loss	214	32.2%	17	29.3%	197	32.5%	.624
Due to COVID-19 stress	180	27.1%	13	22%	167	27.5%	.404
Due to COVID-19 effects on AA treatment	113	17.0%	11	19%	102	16.8%	.675
Medication changes due to COVID-19, n (%)							
All changes	50	7.5%	10	17.2%	40	6.6%	**.003**
Stopped medication	37	5.6%	6	10.3%	31	5.1%	.096
Changed the way take medication	13	2.0%	4	6.9%	9	1.5%	**.004**
Asked provider to change or stop a medication due to COVID-19	17	2.6%	4	6.9%	13	2.1%	**.028**
Reason stopped medication during COVID-19: n (%)							
Clinic closures or avoidance as a personal risk mitigation	17	45.9%	0	0.0%	17	54.8%	**.014**
Immunosuppression concern	10	27.0%	4	66.7%	6	19.4%	**.017**
Other medical reasons	2	5.4%	1	16.7%	1	3.2%	.183
No response	8	21.6%	1	16.7%	7	22.6%	.747
Reason changed medication during COVID-19: n (%)							
Clinic closures or avoidance as a personal risk mitigation	6	46.2%	1	25.0%	5	55.6%	.308
Other medical reasons	6	46.2%	3	75.0%	3	33.3%	.164

[a]P-values represent χ^2-tests of independence between immunosuppressed vs not immunosuppressed status and a given parameter. P-values are statistically significant at a threshold of 5%. Statistically significant P-values are bolded.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Kelly E. Flanagan: conceptualization (supporting), methodology (equal), formal analysis (lead), writing—original (lead), writing—review and editing (equal). James T. Pathoulas: conceptualization (supporting), methodology (equal), formal analysis (supporting), writing—original (supporting), writing review and editing (equal). Chole J. Walker: formal analysis (supporting), writing review and editing (supporting). Isabel Pupo Wiss: formal analysis (supporting), writing review and editing (supporting). Abby Ellison: project administration (equal), writing review and editing (supporting). Natasha Atanaskova Mesinkovska: project administration (equal), writing review and editing (supporting). Maryanne M. Senna: conceptualization (lead), resources (lead), supervision (lead), writing—review and editing (equal).

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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