



Published in final edited form as:

J Am Acad Dermatol. 2022 November ; 87(5): 1093–1095. doi:10.1016/j.jaad.2021.12.050.

Frequency of Immunostimulatory Herbal Supplement Use Among Patients with Autoimmune Skin Disease

Adarsh Ravishankar, MD^{1,2}, Christina E. Bax, MD^{1,2}, Madison Grinnell, BA^{1,2}, Daisy Yan, MD^{1,2}, Josef S. Concha, MD^{1,2}, Lisa Pappas-Taffer, MD², Bridget E. Shields, MD^{1,2}, Mohammed Dany, MD PhD², Ashley K. Clark, MD MAS², Rui Feng, PhD³, Joyce Okawa, RN^{1,2}, Victoria P. Werth, MD^{1,2}

¹Corporal Michael J. Crescenzo VAMC, Philadelphia, Pennsylvania

²Department of Dermatology, University of Pennsylvania, Philadelphia, Pennsylvania

³Department of Biostatistics, University of Pennsylvania, Philadelphia, Pennsylvania

Keywords

Herbal; Immunostimulant; Dermatomyositis; Lupus; Blistering Disease; Bullous Pemphigoid; Pemphigus Vulgaris; Herbal; Spirulina; Echinacea; Chlorella; Alfalfa; Algae

Complementary and alternative medicine (CAM) use is common in the United States [1, 2]. However, certain herbal supplements have immunostimulatory effects, including *Spirulina platensis*, *Aphanizomenon flos-aquae*, *Chlorella*, *Echinacea*, and alfalfa [1]. Patients may consume immunostimulatory CAM for their purported health effects [3, 4]. However, this poses a potential risk for patients with autoimmune skin disease [1]. To characterize the frequency of immunostimulatory CAM use in such patients, we performed a single-center case-control study of herbal supplement use (*Spirulina*, *Echinacea*, *Chlorella*, *Aphanizomenon*, and alfalfa) among adults with dermatomyositis (DM), cutaneous lupus erythematosus (CLE), autoimmune blistering disease (AIBD), and healthy controls without autoimmune disease.

Patients in the principal investigator's clinics were systematically surveyed about herbal supplement use at any point prior to their disease flare. To ensure standardization and minimize recall bias, patients were asked about CAM use in a stepwise manner (Supplementary Material). Healthy controls were surveyed in general dermatology clinics. Chart review information included disease cohort, CAM use history, and demographics. Demographics were analyzed with descriptive statistics. Fisher's exact tests were performed

Correspondence: Victoria P. Werth, MD, Department of Dermatology, Perelman Center for Advanced Medicine, Suite 1-330A, 3400 Civic Center Boulevard, Philadelphia, PA 19104, USA. Tel: +1 215 823 4208, fax: +1 866 755 0625, werth@penmedicine.upenn.edu.

Conflict of Interest:

The authors of this manuscript have no conflicts of interest to disclose.

IRB Approval:

IRB approval has been obtained for this study (University of Pennsylvania IRB # 833981)

to compare the frequency of CAM use among the DM, CLE, and AIBD cohorts to healthy controls. Results were reported as odds ratios at a significance level of 0.05.

450 patients were included in this study (158 DM, 122 CLE, 31 AIBD, 139 controls) (Table 1). CAM use was reported in 19.6% of the DM cohort, 5.7% of CLE, 6.5% of AIBD, and 5.0% of controls (Figure 1, Table 1). *Spirulina* was the most frequently used CAM, with 14.6% of DM patients in the cohort reporting *Spirulina* use, 4.1% of CLE, 0% of AIBD, and 4.3% of controls (Table 1). *Chlorella* (7.6%), *Aphanizomenon flos-aquae* (2.5%), alfalfa (1.9%), and *Echinacea* (2.5%) use were reported in a smaller proportion of DM patients (Table 1). DM patients were significantly more likely to have used immunostimulatory CAMs compared to controls (OR 4.58, $p=0.0002$), in contrast to CLE ($p=0.0956$) or AIBD ($p=0.6688$). *Spirulina* was significantly more likely to be used by DM patients compared to controls (OR 3.76, $p=0.0031$) (Table 1). *Echinacea*, *Aphanizomenon flos-aquae*, *Chlorella*, and Alfalfa were not significantly associated with any autoimmune cohort.

These results demonstrate that immunostimulatory CAM use may be more common among DM patients compared to CLE, AIBD, and controls in this cohort. Among the DM cohort, *Spirulina* was the most common CAM. Limitations include recall bias, the case-control study design, and the single-center nature of this study. This study does not account for timing between CAM use and disease onset, or history of flares. It is unknown whether *Spirulina* affects the course of DM, or whether patients with DM flares were likely to take *Spirulina*. Prospective blinded studies are needed to ascertain the link between *Spirulina* and DM. Although the effects of immunostimulatory CAM on autoimmune skin disease are not currently understood, our work shows that they are used by some dermatology patients. Clinicians should inquire about supplement use in patients with autoimmune skin disease, and assess the potential impact on their patients' clinical course and wellbeing.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements:

William D. James, MD

Funding/Support:

United States Department of Veterans Affairs (Veterans Health Administration, Office of Research and Development and Biomedical Laboratory Research and Development) (VPW). Center for Advancing Translational Sciences of the National Institutes of Health, TL1TR001880 (CEB).

References

1. Chakka S, et al. , The effects of immunostimulatory herbal supplements on autoimmune skin diseases. *Journal of the American Academy of Dermatology*, 2020.
2. Falci L, Shi Z, and Greenlee H, Multiple Chronic Conditions and Use of Complementary and Alternative Medicine Among US Adults: Results From the 2012 National Health Interview Survey. *Prev Chronic Dis*, 2016. 13: p. E61. [PubMed: 27149072]
3. Deng R. and Chow T-J, Hypolipidemic, antioxidant, and antiinflammatory activities of microalgae *Spirulina*. *Cardiovascular therapeutics*, 2010. 28(4): p. e33–e45. [PubMed: 20633020]

4. Karkos PD, et al. , Spirulina in clinical practice: evidence-based human applications. Evidence-based complementary and alternative medicine : eCAM, 2011. 2011: p. 531053–531053.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

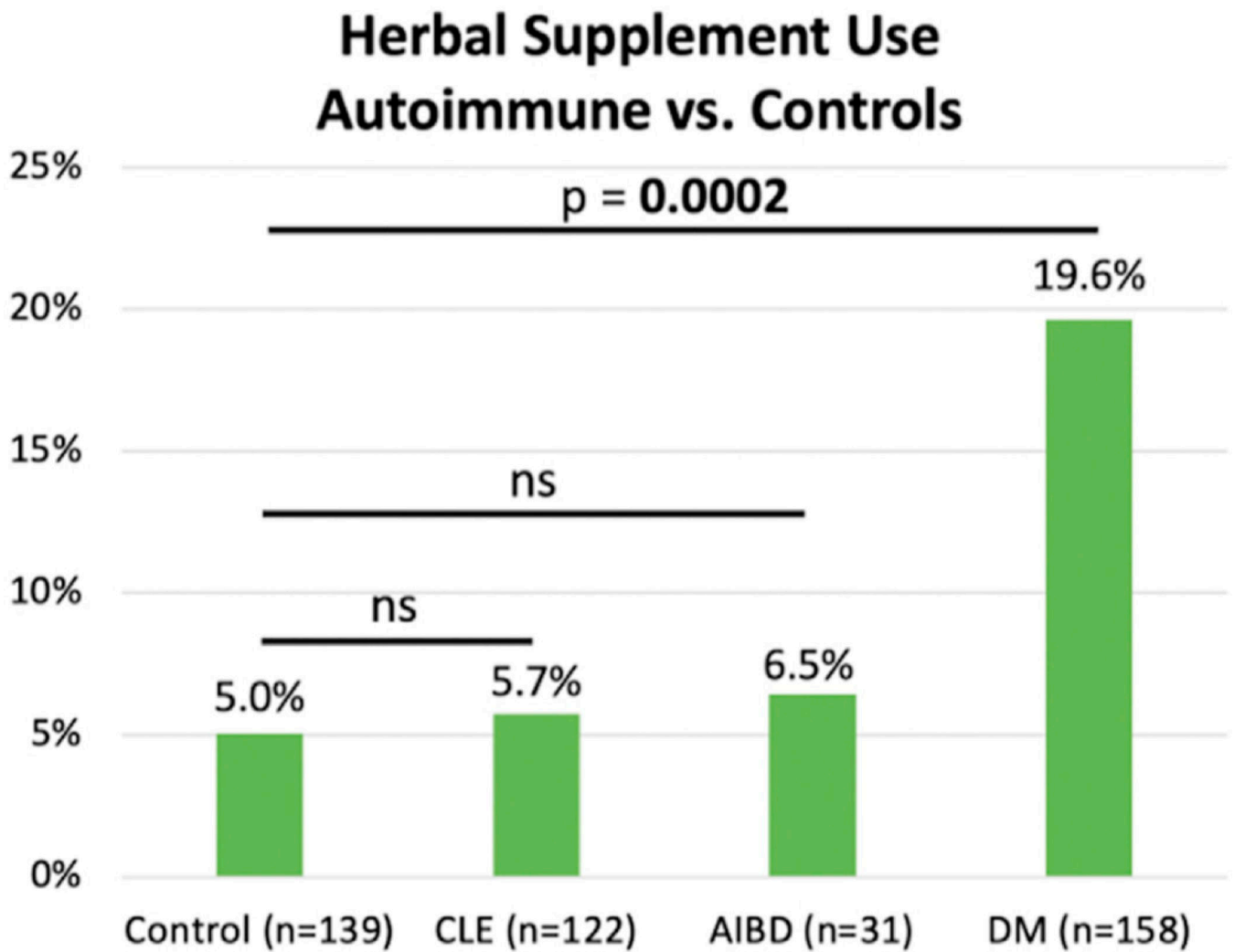


Figure 1: Herbal Supplement Use among Autoimmune Cohorts versus Controls
DM – Dermatomyositis; *CLE* – Cutaneous Lupus Erythematosus; *AIBD* – Autoimmune Blistering Disease; *ns* – Not Statistically Significant ($P > 0.05$)

Table 1:

Demographics

		DM (n = 158)	CLE (n = 122)	AIBD (n = 31)	Control (n = 139)
Sex – n (%)	Female	138 (87.3)	102 (83.6)	22 (71.0)	108 (77.7)
	Male	20 (12.6)	20 (16.4)	9 (29.0)	31 (22.3)
Race – n (%)	White	129 (81.6)	64 (52.5)	19 (61.3)	113 (81.3)
	Black	13 (8.2)	39 (32.0)	1 (3.2)	7 (5.0)
	Asian	5 (3.2)	9 (7.4)	4 (12.9)	10 (7.2)
	Other	11 (7.0)	10 (8.2)	7 (22.6)	9 (6.5)
Age at Disease Onset – Median (IQR)		50.0 (40.1 – 58.2)	34.8 (26.0 – 47.5)	55.3 (49.6 – 65.2)	N/A
Age at Clinic Visit – Median (IQR)		56.0 (48.1 – 67.1)	51.5 (40.6 – 62.4)	64.9 (56.8 – 76.9)	55.1 (35.1 – 66.0)
Spirulina	n (%)	23 (14.6)	5 (4.1)	0 (0)	6 (4.3)
	OR	3.76	0.95	0	N/A
	p-value	0.0031	NS	NS	N/A
Echinacea	n (%)	4 (2.5)	2 (1.6)	1 (3.2)	2 (1.4)
	OR	1.78	1.14	2.27	N/A
	p-value	NS	NS	NS	N/A
Aphanizomenon	n (%)	4 (2.5)	0 (0)	2 (6.5)	1 (0.7)
	OR	3.57	0	9.33	N/A
	p-value	NS	NS	NS	N/A
Chlorella	n (%)	12 (7.6)	2 (1.6)	1 (3.2)	4 (2.9)
	OR	2.77	0.56	1.12	N/A
	p-value	NS	NS	NS	N/A
Alfalfa	n (%)	3 (1.9)	2 (1.6)	0 (0)	2 (1.4)
	OR	1.32	1.14	0	N/A
	p-value	NS	NS	NS	N/A
Any Herbal	n (%)	31 (19.6)	7 (5.7)	2 (6.5)	7 (5.0)
	OR	4.58	1.15	1.30	N/A
	p-value	0.0002	NS	NS	N/A

DM – Dermatomyositis; CLE – Cutaneous Lupus Erythematosus; AIBD – Autoimmune Blistering Disease; N/A – Not Applicable; OR – Odds Ratio; IQR – Interquartile Range; NS – Not Statistically Significant ($p > 0.05$)