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Medical comorbidities and sex distribution among patients with lichen planopilaris and frontal fibrosing alopecia: A retrospective cohort study

To the Editor: Although several small studies have described clinical findings and treatment modalities in lichen planopilaris and frontal fibrosing alopecia, there are sparse epidemiologic data regarding the sex distribution and comorbidities associated with these conditions. Additionally, most studies have combined lichen planopilaris and frontal fibrosing alopecia cohorts rather than examined each group individually. To address this knowledge gap, we performed a retrospective cohort study at Columbia University Irving Medical Center to investigate the sex distribution of lichen planopilaris and frontal fibrosing alopecia and determine whether these patients were at a higher risk of developing other inflammatory conditions.

We queried New York—Presbyterian Hospital and ColumbiaDoctors for patients with the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)* code L66.1 (lichen planopilaris, frontal fibrosing alopecia) between 2015 and 2019. Chart review was performed to verify that all patients with an *ICD-10* code of L66.1 had findings consistent with lichen planopilaris or frontal fibrosing alopecia based on clinical criteria, histologic criteria, or both (Supplemental Methods available via Mendeley at https://data.mendeley.com/datasets/v3wpdnwrjs/1), determined by dermatologists who specialize in hair loss disorders. Additionally, confirmed cases required an unequivocal free-text diagnosis of lichen planopilaris or frontal fibrosing alopecia made by a dermatologist. All patients in the health system who did not have lichen planopilaris or frontal fibrosing alopecia were used as a control. Patients were queried for the comorbidities listed in Table I.

Of 381 patients with *ICD-10* code L66.1, 376 met clinical criteria for lichen planopilaris or frontal fibrosing alopecia (203 lichen planopilaris; 173 frontal fibrosing alopecia). Of 223 available biopsies

Table I. Comorbidities associated with lichen planopilaris/frontal fibrosing alopecia

			Overall		LLP		FFA	
Diagnosis	*ICD-9/ICD-10* codes	Sample size	Overall diagnosis, N (%)	Odds ratio (95% CI)	LLP diagnosis, N (%)	Odds ratio (95% CI)	FFA diagnosis, N (%)	Odds ratio (95% CI)
Atopic dermatitis/ allergic rhinitis/ asthma	691.8/L20.9, 477.9/J30.9, 493.92/J45	Yes (61,733)	14 (3.7)	0.70 (0.41–1.20)	6 (2.9)	0.55 (0.25–1.25)	8 (4.6)	0.88 (0.43–1.79)
		No (1,127,774)	364 (96.3)	1 [Reference]	198 (97.1)	1 [Reference]	166 (95.4)	1 [Reference]
Graves disease	242.0/E05.00	Yes (1668)	0	—	0	—	0	—
		No (1,189,507)	378 (100.0)	1 [Reference]	204 (100.0)	1 [Reference]	174 (100.0)	1 [Reference]
Hypothyroid	244.9, 244.8/ E03.09, Z86.39, V12.29	Yes (39,620)	21 (5.6)*	1.71 (1.10–2.65)*	9 (4.4)	1.34 (0.69–2.62)	12 (6.9)*	2.15 (1.20–3.87)*
		No (1,149,887)	357 (94.4)	1 [Reference]	195 (95.6)	1 [Reference]	162 (93.1)	1 [Reference]
Hashimoto	245.2/E06.3	Yes (3406)	2 (0.5)	1.85 (0.46–7.44)	1 (0.5)	1.72 (0.24–12.24)	1 (0.6)	2.02 (0.28–14.38)
		No (1,186,101)	376 (99.5)	1 [Reference]	203 (99.5)	1 [Reference]	173 (99.4)	1 [Reference]
Hyperthyroid	241/E05.9	Yes (3573)	1 (0.3)	0.88 (0.12–6.27)	0	—	1 (0.6)	1.92 (0.27–13.71)
		No (1,185,934)	377 (99.7)	1 [Reference]	204 (100.0)	1 [Reference]	173 (99.4)	1 [Reference]

Celiac	K90.0/579.0	Yes (3538)	2 (0.5)	1.78 (0.44−7.16)	1 (0.5)	1.65 (0.23−11.78)	1 (0.6)	1.94 (0.27−13.84)
		No (1,185,969)	376 (99.5)	1 [Reference]	203 (99.5)	1 [Reference]	173 (99.4)	1 [Reference]
Multiple sclerosis	340/G35	Yes (6894)	2 (0.5)	0.92 (0.23−3.67)	1 (0.5)	0.85 (0.12−6.03)	1 (0.6)	0.99 (0.14−7.09)
		No (1,182,613)	376 (99.5)	1 [Reference]	203 (99.5)	1 [Reference]	173 (99.4)	1 [Reference]
Psoriasis	696, 696.1/ L40.52, L40.0, L40.5, L40.9	Yes (4545)	14 (3.7)*	10.06 (5.89−17.16)*	6 (2.9)*	7.9 (3.51−17.83)*	8 (4.60)*	12.59 (6.19−25.60)*
		No (1,184,962)	364 (96.3)	1 [Reference]	198 (97.1)	1 [Reference]	166 (95.4)	1 [Reference]
Crohns/ulcerative colitis/IBD	555.0, 555.1, 555.2, 555.9/K10.00 556/K51.90564.1, 579/K58.1, Z87.19, K58.9, K58.0, V12.79	Yes (20,287)	8 (2.1)	1.25 (0.62−2.51)	5 (2.5)	1.45 (0.60−3.52)	3 (1.7)	1.01 (0.32−3.17)
		No (1,169,2200)	370 (97.9)	1 [Reference]	199 (97.5)	1 [Reference]	171 (98.3)	1 [Reference]
Systemic lupus erythematous	710.0/M32.9	Yes (3002)	4 (1.1)*	4.23 (1.58−11.34)*	1 (0.5)	1.95 (0.27−13.90)	3 (1.7)*	6.95 (2.22−21.75)*
		No (1,184,505)	374 (98.9)	1 [Reference]	203 (99.5)	1 [Reference]	171 (98.3)	1 [Reference]
Rheumatoid arthritis	714, 716.95/ M19.9, M16.12, V87.39, M05.9, V13.4	Yes (11,710)	7 (1.9)	1.90 (0.90−4.01)	4 (2.0)	2.01 (0.75−5.42)	3 (1.7)	1.77 (0.56−5.53)
		No (1,177,797)	371 (98.2)	1 [Reference]	200 (98.0)	1 [Reference]	171 (98.3)	1 [Reference]
Sjögren	710.2/M35.0	Yes (876)	0	—	0	—	0	—
		No (1,188,631)	378 (100.0)	1 [Reference]	204 (100.0)	1 [Reference]	174 (100.0)	1 [Reference]
Vitiligo	709.01/L80	Yes (1085)	2 (0.5)*	5.85 (1.46−23.46)*	0	—	2 (1.2)*	12.76 (3.16−51.49)*
		No (1,188,422)	376 (99.5)	1 [Reference]	204 (100.0)	1 [Reference]	172 (98.8)	1 [Reference]
Diabetes (overall)	E10.9/250.01 E11.9/250.00	Yes (64,010)	11 (2.9)*	0.53 (0.29−0.96)*	4 (2.0)*	0.35 (0.13−0.95)*	7 (4.0)	0.74 (0.35−1.57)
		No (1,125,497)	367 (97.1)	1 [Reference]	200 (98.0)	1 [Reference]	167 (96.0)	1 [Reference]
Diabetes (type 1)	E10.9/250.01	Yes (5243)	1 (0.3)	0.60 (0.08−4.27)	1 (0.5)	1.11 (0.16−7.93)	0	—
		No (1,184,264)	377 (99.7)	1 [Reference]	203 (99.5)	1 [Reference]	174 (100.0)	1 [Reference]
Diabetes (type 2)	E11.9/250.00	Yes (61,354)	10 (2.7)*	0.50 (0.27−0.94)*	3 (1.5)*	0.27 (0.09−0.86)*	7 (4.0)	0.77 (0.36−1.64)
		No (1,128,153)	368 (97.4)	1 [Reference]	201 (98.5)	1 [Reference]	167 (96.0)	1 [Reference]
Lichen planus	697.0/L43.9	Yes (318)	5 (1.3)*	51.01 (20.98−124.03)*	4 (2.0)*	75.75 (28.0−205.05)*	1 (0.6)*	21.74 (3.04−155.28)*
		No (1,189,189)	373 (98.7)	1 [Reference]	200 (98.0)	1 [Reference]	173 (99.4)	1 [Reference]

CI, Confidence interval; —, no data; *FFA*, frontal fibrosing alopecia; *IBD*, inflammatory bowel disease; *ICD-9*, *International Classification of Diseases, Ninth Revision*; *ICD-10*, *International Statistical Classification of Diseases and Related Health Problems, 10th Revision*; *LPP*, lichen planopilaris.
*Significant at $P < .05$.

Table II. Demographic information for patients with lichen planopilaris/frontal fibrosing alopecia

Category (n)	FFA/LLP diagnosis, N (%)	LLP diagnosis, N (%)	FFA diagnosis, N (%)	No FFA/LLP diagnosis, N (%)
Sex				
Female patient (675,869)	306 (81.4)	147 (72.4)	159 (91.9)	675,563 (56.9)
Male patient (512,090)	70 (18.7)	56 (27.6)	14 (8.1)	512,020 (43.1)
Age, y				
1−10 (124,472)	0	0	0	124,472 (10.5)
11−20 (114,711)	0	0	0	114,711 (9.7)
21−30 (153,069)	13 (3.4)	12 (5.8)	1 (0.6)	153,069 (12.9)
31−40 (172,628)	59 (15.6)	45 (22.1)	14 (8.1)	172,628 (14.5)
41−50 (140,854)	56 (14.8)	36 (17.7)	20 (11.5)	140,854 (11.9)
51−60 (147,914)	80 (21.2)	38 (18.6)	42 (24.1)	147,913 (12.4)
61−70 (144,673)	91 (24.1)	33 (16.2)	58 (33.3)	144,673 (12.2)
71−80 (113,106)	63 (16.7)	32 (15.7)	31 (17.8)	113,106 (9.5)
81−90 (58,556)	16 (4.2)	8 (3.9)	8 (4.6)	58,556 (4.9)
≥91 (19,147)	0	0	0	19,147 (1.6)
Race and ethnicity				
White				
Hispanic (97,414)	21 (11.5)	12 (12.6)	9 (10.3)	97,393 (24.9)
Non-Hispanic (213,482)	123 (67.6)	60 (63.2)	63 (72.4)	213,359 (54.5)
Unknown (80,843)	38 (20.9)	23 (24.2)	15 (17.2)	80,805 (20.6)
Black				
Hispanic (18,846)	3 (25.0)	2 (50.0)	1 (12.5)	18,843 (22.6)
Non-Hispanic (39,333)	3 (25.0)	0	3 (37.5)	39,330 (47.1)
Unknown (25,328)	6 (50.0)	2 (50.0)	4 (50.0)	25,320 (30.3)
Asian				
Hispanic (3568)	0	0	0	3568 (12.0)
Non-Hispanic (17,301)	9 (75.0)	4 (80.0)	5 (71.4)	17,292 (58.2)
Unknown (8855)	3 (25.0)	1 (20.0)	2 (28.6)	8852 (29.8)
Other (other, American Indian/Alaska Native, Native Hawaiian/ other Pacific Islander)				
Hispanic (20,651)	1 (20.0)	1 (50.0)	0	20,650 (46.3)
Non-Hispanic (6549)	3 (60.0)	1 (50.0)	2 (66.7)	6546 (14.7)
Unknown (17,409)	1 (20.0)	0	1 (33.3)	17,408 (39.0)
Unknown				
Hispanic (70,938)	13 (7.8)	9 (9.2)	4 (5.8)	70,925 (11.1)
Non-Hispanic (24,419)	5 (3.0)	2 (2.0)	3 (4.4)	24,414 (3.8)
Unknown (544,571)	149 (89.2)	87 (88.9)	62 (89.9)	544,422 (85.1)

FFA, Frontal fibrosing alopecia; *LPP*, lichen planopilaris.

reviewed, 204 met criteria for lichen planopilaris or frontal fibrosing alopecia. In free-text history, 257 patients reported symptoms characteristic of these disorders, such as pain, burning, or itching of the scalp. A total of 1,189,507 patients were in the Columbia University Irving Medical Center health care system at the end of 2018. The average age was 53.4 ± 16.1 years for lichen planopilaris and 60.9 ± 12.7 years for frontal fibrosing alopecia (Table II).

There was a strong female preponderance of disease, with an odds ratio (OR) of 1.99 (95% confidence interval [CI] 1.46 to 2.71) for lichen planopilaris and 8.60 (95% CI 4.98 to 14.85) for frontal fibrosing alopecia. This supports prior studies showing increased prevalence of lichen planopilaris and autoimmune conditions in female patients.[1]

In terms of comorbidities, patients with lichen planopilaris or frontal fibrosing alopecia were more likely to have hypothyroidism (OR 1.71 [95% CI 1.10 to 2.65]), psoriasis (OR 10.06 [95% CI 5.89 to 17.16]), systemic lupus erythematosus (OR 4.23 [95% CI 1.58 to 11.34]), vitiligo (OR 5.85 [95% CI 1.46 to 23.46]), and lichen planus (OR 51.01 [95% CI 20.98 to 124.03]). They were less likely to have

diabetes mellitus (OR 0.53 [95% CI 0.29 to 0.96)]. These findings support prior literature showing positive association with lichen planus, systemic lupus erythematosus, and hypothyroidism and negative association with diabetes mellitus.[2-5] We also found new associations with psoriasis and vitiligo.

Although prior studies have examined the association of autoimmune comorbidities with lichen planopilaris and frontal fibrosing alopecia, to our knowledge this is the first study to compare a cohort of patients with lichen planopilaris or frontal fibrosing alopecia with a large control population and to separately examine each condition. In prior studies, lichen planopilaris and frontal fibrosing alopecia were examined together,[5] although emerging evidence suggests they may be distinct disease processes. The use of a large control population supports the generalizability of the results to the US population. Limitations to our study include the retrospective nature; the imperfect standard of using *ICD* codes to assess for comorbidities including psoriasis, lichen planus, and systemic lupus erythematosus; and how lack of a validated diagnostic guideline for lichen planopilaris and frontal fibrosing alopecia diagnosis could lead to subjectivity regarding diagnosis.

In conclusion, female sex, inflammatory conditions, and autoimmune conditions including thyroid disorders and lichen planus were associated with lichen planopilaris and frontal fibrosing alopecia. Larger prospective studies are needed to further investigate these associations.

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Combination oral minoxidil and spironolactone for the treatment of androgenetic alopecia in adolescent girls

To the Editor: Androgenetic alopecia (AGA) is an under-recognized form of hair loss in the pediatric population, with very little discussion in the literature, particularly regarding treatment. Topical minoxidil is approved for the treatment of AGA in adults and is used off-label in children and adolescents, although efficacy is variable. Spironolactone has been reported to improve AGA in adult women[1] as well as in a 9-year-old girl.[2] Oral minoxidil (OM) is approved for the treatment of hypertension, and at standard doses (10-40 mg), potential adverse effects include hypertrichosis (most common), fluid retention, and tachycardia as well as more serious cardiac adverse effects.

This risk profile has historically deterred dermatologists from using OM in clinical practice; however, it is being increasingly used at lower doses as a treatment for hair disorders, with the available