SKIN

BRIEF ARTICLE

Comorbidities, Healthcare Utilization, and Costs Associated With Alopecia Totalis and Alopecia Universalis in the United States

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ABSTRACT

Background: Alopecia areata (AA) is an autoimmune disease characterized by nonscarring hair loss. Extensive forms of AA include alopecia totalis (AT; complete scalp hair loss) or alopecia universalis (AU; complete scalp, face, and body hair loss). Limited information exists about the cost and healthcare burden of AT and AU.
Methods: Using a large US administrative healthcare claims database, two mutually exclusive patient cohorts were identified: AA cohort: ≥1 diagnosis of AA; AT/AU cohort: ≥1 diagnosis of AT/AU between January 1 and December 31, 2017. Baseline characteristics measured at first AA diagnosis (index date) and all-cause healthcare utilization and costs identified in the 1-year post-index period were compared between AT/AU and non-AT/AU AA cohorts.
Results: 14,340 patients with AA were identified, including 1,224 patients with AT or AU. Compared with patients with non-AT/AU AA (n=13,116), patients with AT/AU were older (mean age 43.1 vs 40.6 years, $P<0.0001$) and more were female (68.1% vs 62.9%, $P<0.0001$). More patients with AT/AU had baseline comorbidities (atopic disease [28.3% vs 24.1%], anemia [10.4% vs 7.4%], autoimmune disorders [9.6% vs 5.5%]; $P\leq0.001$ for all). Post-index patients with AT/AU had higher per person per policy year healthcare resource utilization and costs ($P\leq0.001$) and total adjusted annual mean costs ($P<0.05$). Over 50% more patients with AT/AU received immunosuppressive agents than patients with non-AT/AU AA.
Conclusion: Patients with AT/AU had higher rates of comorbidities and greater healthcare resource utilization medical costs than patients with non-AT/AU AA, suggesting that improved insight into the patterns of specific comorbid conditions is needed.

INTRODUCTION

Alopecia areata (AA) is an autoimmune disorder with a lifetime incidence of 2%.[1] Up to 7% of patients with AA may experience more progressive hair loss, either affecting all scalp hair (alopecia totalis; AT) or the entire scalp, face, and body surface area (alopecia universalis; AU). Patients with AT or AU

seldom experience spontaneous recovery.[2-4] Treatment efficacy is variable and limited in this subset of AA patients, with cases often recalcitrant to treatment.[5] Although comorbidities such as atopic dermatitis, anxiety, and mood disorders are associated with AA,[6] limited information exists about the financial and healthcare resource burden of AA including AT/AU.

In our prior study of a large retrospective cohort of US administrative healthcare claims data (IQVIA PharMetrics® Plus), patients with AA including AT/AU (n=14,340) had significantly higher mean per-patient-per-year (PPPY) healthcare resource utilization (HCRU) and total all-cause medical costs compared with matched non-AA controls ($9,154 vs $5,787; *P*<0.0001).[7] The high rate of comorbidities (other autoimmune disorders, cardiovascular disease, and malignancy) contributed to the increased costs in AA. Increased costs due to inpatient stay, emergency department (ED) and ambulatory visits, and prescription spending were also observed.

METHODS

In this study, using the same retrospective cohort of US administrative healthcare claims data (IQVIA PharMetrics® Plus[8]) of patients with AA, we further evaluated the baseline characteristics and the 1-year all-cause HCRU and medical costs in patients with AT/AU only in comparison with patients with non-AT/AU AA. Briefly, data for the study included all patients with continuous pharmacy and medical enrollment between January 1 and December 31, 2017. Patients with AA (AT/AU and non-AT/AU) were required to have continuous pharmacy and medical enrollment in the database for 365 days before the first encountered AA diagnosis (index date) known as baseline period and for 365 days after the index date (evaluation period). Two mutually exclusive criteria for patient cohorts were identified: AA cohort: ≥1 diagnosis of AA (ICD-10 = L63.*); AT/AU cohort: ≥1 diagnosis of AT/AU (in any ICD-10 code position [L63.0 and L63.1])[9] between January 1 and December 31, 2017.

All-cause healthcare costs and utilization measures were identified in the 365-day post-index period while variables such as age, sex, region, and payer type were measured at index. Quan-Charlson's Comorbidity index[10] was measured during the 365-day baseline period. All demographics, clinical characteristics, comorbidities, HCRU, medical, and pharmacy costs were analyzed descriptively and mean, median, and standard deviation reported on unadjusted observed costs. Costs were adjusted to 2018 US dollars using the Medical Care component of the Consumer Price Index.[11] Full details of study design and methods have been reported previously.[7]

RESULTS

A subset of 1,224 patients with AT or AU were identified from the AA population, which represented 9% of the total AA cohort (n=14,340). Compared with patients with non-AT/AU AA (n=13,116), patients with AT/AU were slightly older (mean age 43.1 years vs 40.6 years, *P*<0.0001) and more were female (68.1% vs 62.9%, *P*<0.0001) (**Table 1**). Approximately one-third of the AT/AU and non-AT/AU AA claims were initiated by a dermatologist. The proportion of patients with comorbidities at baseline was higher in the AT/AU cohort, for atopic disease (28.3% vs 24.1%), anemia (10.4% vs 7.4%), and autoimmune disorders (9.6% vs 5.5%; *P*≤0.001 for all). Pre-index, all-cause total costs were also higher in patients with AT/AU

Table 1. Baseline patient demographics, clinical characteristics, and costs

Variable	AT or AU n = 1,224	Non-AT/AU n = 13,116	*P* value
Age on index date, y			<0.0001
Mean (SD)	43.14 (15.44)	40.58 (14.62)	
Median (IQR)	45 (32-55)	41 (30-52)	
Age grouping categories, n (%)			<0.0001
12-17 y	91 (7.43)	957 (7.30)	
18-44 y	504 (41.18)	6,652 (50.72)	
45-64 y	568 (46.41)	5,123 (39.06)	
≥65 y	61 (4.98)	384 (2.93)	
Sex, n (%)			0.0003
Female	834 (68.14)	8,254 (62.93)	
Male	390 (31.86)	4,862 (37.07)	
Region, n (%)			<0.0001
Midwest	271 (22.14)	3,530 (26.91)	
Northeast	334 (27.29)	3,013 (22.97)	
South	442 (36.11)	4,986 (38.01)	
West	177 (14.46)	1,587 (12.10)	
Payor, n (%)			0.86
Commercial	1,196 (97.71)	12,844 (97.93)	
Medicaid	18 (1.47)	181 (1.38)	
Medicare	10 (0.82)	91 (0.69)	
Baseline pre-QCCI score			
Mean (SD)	0.44 (1.04)	0.30 (0.81)	<0.0001
Median	0	0	
QCCI categories, n (%)			<0.0001
0 comorbidities	926 (75.65)	10,752 (81.98)	
1-2 comorbidities	250 (20.42)	2,065 (15.74)	
3-4 comorbidities	29 (2.37)	218 (1.66)	
≥5 comorbidities	19 (1.55)	81 (0.62)	
CVD at baseline, n (%)	190 (15.52)	1,763 (13.44)	0.045
Autoimmune disorder at baseline, n (%)	118 (9.64)	718 (5.47)	<0.0001
Atopic disease at baseline, n (%)	346 (28.27)	3,155 (24.05)	0.001
Anemia at baseline, n (%)	127 (10.38)	969 (7.39)	0.0002
Pre-index dermatologist visit, n (%)	489 (39.95)	5,158 (39.33)	0.69
Pre-index count of dermatologist visits			
Mean (SD)	1.24 (2.41)	1.17 (2.48)	0.36
Median	0	0	
Pre-index all-cause total cost			
Mean (SD)	$10,060 ($17,701)	7,250 (14,272)	<0.0001
Median	3,421	2,473	

Clinical characteristics are within 365 days pre-index.
AT, alopecia totalis; AU, alopecia universalis; CVD, cardiovascular disease; IQR, interquartile range; QCCI, Quan-Charlson Comorbidity Index; SD, standard deviation

Table 2. Healthcare resource utilization and costs within 365 days post-index

Variable	AT or AU N = 1,224	Non-AT/AU N = 13,116	*P* value	Difference ($)	% of the total difference
Inpatient visits, mean (SD)					
Number of visits	0.06 (0.30)	0.05 (0.28)	0.25		
Costs, $	1,291 (12,807)	1,162 (9,268)	0.001	128	3.53
Emergency department visits, mean (SD)					
Number of visits	0.21 (0.61)	0.23 (0.66)	0.45		
Costs, $	455 (1,866)	495 (2,084)	0.0002	–41	–1.13
Ambulatory visits, mean (SD)					
Number of visits	14.8 (13.9)	13.6 (13.1)	0.003		
Costs, $	4,735 (11,141)	3,538 (7,202)	0.007	1,197	32.98
Other visits,[1] mean (SD)					
Number of visits Costs, $	1.50 (6.02) 812 (4,430)	0.97 (4.13) 538 (2,783)	0.002 <0.0001	274	7.55
Pharmacy prescriptions filled, mean (SD)					
Number of prescriptions	20.22 (23.0)	16.56 (21.47)	<0.0001		
Costs, $	5,180 (18,440)	3,111 (15,439)	0.0001	2,070	57.04
Total costs, $, mean (SD)	12,473 (30,422)	8,844 (23,246)	<0.0001	3,629	100
Adjusted costs, $, mean (95% CI)	8,659 (7,452–10,061)	7,555 (6,809–8,383)	0.03	1,104	–

Adjusted for 12m pre-index total cost, 12m pre-index QCCI comorbidity score, 12m pre-index presence of CVD, autoimmune disorder, atopic disease, anemia, gender, age region.
[1]Includes durable medical equipment, home healthcare, and additional miscellaneous categories
AT, alopecia totalis; AU, alopecia universalis; CI, confidence interval; CVD cardiovascular disease; QCCI, Quan-Charlson Comorbidity Index; SD, standard deviation

Table 3. Sensitivity analysis: Healthcare resource utilization and costs excluding patients with a cancer diagnosis within 365 days pre- and post-index

Variable	AT/AU n = 1,104	Non-AT/AU n = 12,340	*P* value
Inpatient visit, mean (SD)			
No. of visits	0.06 (0.30)	0.04 (0.26)	0.09
Costs, $	1,292 (13,317)	1,017 (8,828)	0.50
ED visit, mean (SD)			
No. of visits	0.21 (0.61)	0.23 (0.65)	0.41
Costs, $	398 (1,473)	485 (2,067)	0.06
Ambulatory visit, mean (SD)			
No. of visits	13.75 (12.66)	13.05 (12.74)	0.08
Costs, $	3,631 (6,762)	3,110 (5,196)	0.01
Other visit, mean (SD)			
No. of visits	1.37 (5.90)	0.90 (3.65)	0.01
Costs, $	676 (4,275)	500 (2,732)	0.18
Prescriptions filled, mean (SD)			
No. of prescriptions filled	19.20 (22.12)	15.93 (20.79)	<0.0001
Costs, $	4,396 (15,073)	2,779 (14,114)	0.0006
Total costs, $, mean (SD)	10,393 (24,405)	7,891 (20,627)	0.001

AT, alopecia totalis; AU, alopecia universalis; SD, standard deviation

vs patients with non-AT/AU AA (*P*<0.0001) (**Table 1**).

Post-index patients with AT/AU had higher per person per policy year (PPPY) HCRU and costs vs patients with non-AT/AU AA (*P*≤0.001), with a greater number of inpatient, ambulatory, and other types of outpatient visits (e.g., durable medical equipment, home healthcare, and additional miscellaneous categories) (**Table 2**). The mean number of prescriptions filled accounted for over 50% of the total cost difference between the two groups, with incremental costs of US$2,070 PPPY. The overall total cost in the AT/AU cohort was US$3,629 greater than patients with non-AT/AU AA. There were greater total adjusted annual mean costs for AT/AU vs non-AT/AU AA (*P*<0.05). During the study period, over 50% more patients with AT/AU used immunosuppressive agents, mainly selective immunosuppressants (34%), than patients with non-AT/AU AA. Given concern for possible misdiagnosis of patients with chemotherapy-related alopecia, a sensitivity analysis was performed excluding patients with a cancer diagnosis within 365 days pre- and post-index which demonstrated maintained higher costs for the AT/AU cohort (**Table 3**).

DISCUSSION

This retrospective healthcare claims analysis used stratification of AA patients to identify a subset of AT/AU patients to compare HCRU and healthcare costs in patients diagnosed with AT/AU with non-AT/AU AA. The study shows that patients with AT/AU have more comorbidities at baseline, including higher incidence of autoimmune disorders, atopic disease, and anemia. Further, upon evaluation of total healthcare costs that include any comorbidity-related costs, we note patients with AT/AU incur more HCRU and costs. These differences are attributable to a higher number of healthcare visits and higher pharmacy spending in AT/AU compared with non-AT/AU AA.

Our study findings of higher comorbidities in patients with AT/AU than in patients with non-AT/AU AA suggest that improved insight into the patterns of specific comorbid conditions, especially those that are not considered or known to be associated with AA (e.g., cardiovascular disease), is required. Future studies should evaluate long-term outcomes including any consideration of newer treatments in this patient population.

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Conflict of Interest Disclosures: AMo reports consulting fees from Pfizer Inc., hims, and 3Derm and equity from Lucid and hims. AMe and DG are employees of and may hold stock and/or stock options from Pfizer. MR, KG, and VS were employees of Pfizer Inc. when this study was conducted and may hold stock and/or stock options from Pfizer Inc.

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