Real World Prescribing Patterns of Dupilumab for Atopic Dermatitis

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Background

The prevalence of atopic dermatitis (AD) in the United States is approximately 12% in children and ~7% in adults.[1] About one in every five patients with AD presents with moderate to severe disease. Treatments approved by the US Food and Drug Administration (FDA), including emollients, topical glucocorticoids, and calcineurin inhibitors, may have limited efficacy in the treatment of moderate to severe AD.[2] Dupilumab, a fully human monoclonal antibody, has been shown to improve AD rapidly and substantially through the inhibition of interleukin (IL)-4 and IL-13.[3] We sought to test the hypothesis that dupilumab, an expensive biologic medication (~3.5K/dose)[4] might be less commonly prescribed for Black and Hispanic patients as compared to White patients.

Methods

We conducted a retrospective, observational cohort study examining prescribing patterns of the systemic agent dupilumab for AD, using electronic data from the University of Colorado Anschutz Medical Campus and its affiliates, via Health Data Compass (healthdatacompass.org). Each patient characteristic was assessed using logistic regression with the binary outcome of receiving dupilumab or not. The p-values associated with multi-level categorical characteristics (race, diagnoses) were corrected for multiple testing using the False Discovery Rate Method. Study subjects were between the ages of 18 and 85 years as of 3/28/2017 (the date dupilumab was FDA-approved to treat moderate to severe AD in those age 18 and older). AD diagnosis inclusion criteria included having at least two diagnoses of AD using ICD-10 codes; required two diagnoses in the availability window (3/28/2017-3/27/2021) or one diagnosis in the availability window and a second between 3/28/2013-3/27/2017. Dupilumab start date was required to be on/after 3/28/2017, and to occur on or after a diagnosis of AD.

Results

Two hundred forty-nine of 6421 persons (3.9%) meeting AD diagnosis criteria received at least one dupilumab prescription. Mean (standard deviation) age among those prescribed dupilumab for AD was 47 (22) years and 57% were female. Summary statistics appear in Table 1. Odds of receiving a dupilumab prescription according to patient characteristics are illustrated in Table 2. Prescribing differed by patient race and most recent AD diagnosis. Distribution of dupilumab prescription by diagnosis is displayed in Figure 1.

Conclusion

Our analyses suggest that Black patients were more likely to be prescribed dupilumab than White/Caucasian patients in our Colorado academic healthcare system. OHDSI collaborators are encouraged to investigate this topic among other populations and healthcare systems utilizing the OHDSI network (https://forums.ohdsi.org/t/seeking-collaborators-for-atopic-dermatitis-and-dupilumab-study/13873/10?u=tsivesind); our AD cohort may be found at https://api.ohdsi.org/WebAPI/cohortdefinition/1777515. Areas for further analysis should explore associations with severity of disease, insurance type, and inclusion of AD patients who had another diagnosis that may be treated with dupilumab (e.g., chronic rhinosinusitis, nasal polyps, and asthma).

User Prevalence	Did Not Receive (N=6172)	Received (N=249)	Overall (N=6421)
Age			
Mean (SD)	53.3 (17.9)	51.4 (16.7)	53.2 (17.9)
Median [Min, Max]	54.0 [22.0, 89.0]	52.0 [22.0, 87.0]	54.0 [22.0, 89.0]
Sex			
Female	3532 (57.2%)	146 (58.6%)	3678 (57.3%)
Male	2621 (42.5%)	102 (41.0%)	2723 (42.4%)
Missing	19 (0.3%)	1 (0.4%)	20 (0.3%)
Race			
American Indian and Alaska Native	20 (0.3%)	1 (0.4%)	21 (0.3%)
Asian	246 (4.0%)	11 (4.4%)	257 (4.0%)
Black or African American	397 (6.4%)	34 (13.7%)	431 (6.7%)
Multiple Race	161 (2.6%)	6 (2.4%)	167 (2.6%)
Native Hawaiian and Other Pacific Islander	12 (0.2%)	0 (0%)	12 (0.2%)
Other	340 (5.5%)	13 (5.2%)	353 (5.5%)
White or Caucasian	4912 (79.6%)	179 (71.9%)	5091 (79.3%)
Missing	84 (1.4%)	5 (2.0%)	89 (1.4%)
Ethnicity			
Hispanic	563 (9.1%)	20 (8.0%)	583 (9.1%)
Non-Hispanic	5491 (89.0%)	226 (90.8%)	5717 (89.0%)
Missing	118 (1.9%)	3 (1.2%)	121 (1.9%)
Diagnosis			
Atopic dermatitis	3050 (49.4%)	213 (85.5%)	3263 (50.8%)
Atopic neurodermatitis	107 (1.7%)	14 (5.6%)	121 (1.9%)
Flexural eczema	758 (12.3%)	5 (2.0%)	763 (11.9%)
Nummular eczema	1120 (18.1%)	6 (2.4%)	1126 (17.5%)
Vesicular eczema	1137 (18.4%)	11 (4.4%)	1148 (17.9%)

Table 1. Summary statistics: overall, and by patients who did and did not receive dupilumab

Variable	OR (CI)	P Value
Age		
Per 10-year increase	0.944 (0.879,1.013)	0.111
Sex		
Male	ref	—
Female	0.941 (0.726,1.217)	0.647
Race		
White or Caucasian	ref	—
American Indian or Alaska Native*	—	—
Asian	1.228 (0.622,2.183)	0.862
Black or African American	2.352 (1.583,3.397)	<0.001
Multiple Race	1.024 (0.398,2.15)	0.956
Native Hawaiian or Other Pacific Islander*	—	—
Other	1.05 (0.564,1.791)	0.956
Ethnicity		
Non-Hispanic or Latino	ref	—
Hispanic or Latino	0.863 (0.526,1.340)	0.535
Diagnoses		
Atopic Dermatitis	ref	—
Atopic Neurodermatitis	1.87 (1.01,3.22)	0.032
Flexural Eczema	0.0945 (0.0335,0.207)	<0.001
Nummular Eczema	0.0767 (0.0302,0.158)	<0.001
Vesicular Eczema	0.139 (0.0708,0.243)	<0.001

Table 2. Receipt of dupilumab by patient characteristics

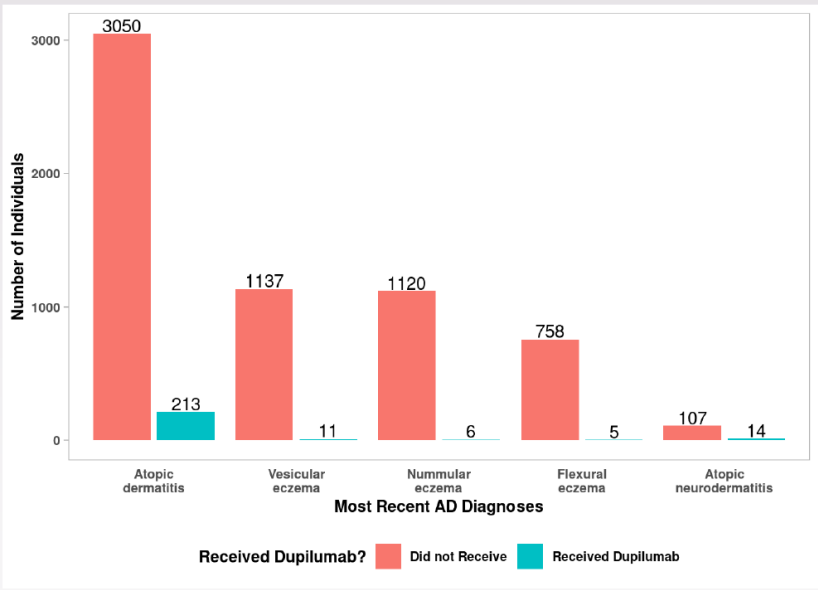

Figure 1. Dupilumab prescriptions by most recent AD diagnosis

References/Citations

1. DaVeiga SP. Epidemiology of atopic dermatitis: a review. Allergy Asthma Proc. 2012;33(3):227-234.

doi:10.2500/aap.2012.33.3569
2. Siegels D, Heratizadeh A, Abraham S, et al. Systemic treatments in the management of atopic dermatitis: A systematic review and meta-analysis. Allergy. 2021;76(4):1053-1076. doi:10.1111/all.14631
3. Guttman-Yassky E, Bissonnette R, Ungar B, et al. Dupilumab progressively improves systemic and cutaneous abnormalities in patients with atopic dermatitis. J Allergy Clin Immunol. 2019;143(1):155-172. doi:10.1016/j.jaci.2018.08.022
4. Drugs.com. Dupixent Prices. https://www.drugs.com/price-guide/dupixent, accessed 1/19/22