

Prescribing Patterns for Atopic Dermatitis in the United States

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ABSTRACT

Introduction: Introduction: Although future atopic dermatitis (AD) clinical research is intended to improve standard-of-care treatment, how patients are currently treated is not well characterized. The purpose of this study was to determine the most frequent medications prescribed in all ages of AD.

Methods: The National Ambulatory Medical Care Survey (NAMCS) is a nationally representative survey of United States office-based ambulatory visits and records demographics, diagnoses, and treatments. This is a cross-sectional study using the NAMCS of all AD outpatient office visits from 2006 to 2015. Patient visits with an ICD-9-CM code for AD (691.8) were collected and analyzed. Frequency tables were created for age, race, providers managing AD, and treatment.

Results: Patient demographics of AD visits included 51% male (95% Confidence Interval [CI]: 44-58%), 71% white (65-77%), 19% African American (14-25%), and 10% Asian (6-14%). About 31% (24-37%) of visits were to pediatricians and 27% (22-33%) to dermatologists whereas per physician, dermatologists managed more AD visits than pediatricians. Topical corticosteroids (59%; 52-66%) were the most common class of medications prescribed followed by antibiotics (11%; 6-16%) and second generation antihistamines (6%; 3-10%). The most common topical corticosteroid prescribed in AD was triamcinolone (25% of office visits; 18-31%). Hydrocortisone was the most common topical corticosteroid prescribed to children <1 year of age and children aged 8 to 18, whereas triamcinolone was more common in children 2 to 7 years and adults >18 years.

Discussion: Topical corticosteroids were the most frequent prescriptions provided at office-based ambulatory visits whereas antibiotics and second-generation antihistamines were the second and third most common prescribed medications, respectively. Although pediatricians manage more AD visits than dermatologists in total visits, dermatologists manage more AD visits than pediatricians per physician. Characterizing how AD patients are currently treated may build a reference for future clinical research investigating novel standard-of-care treatment in AD.

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INTRODUCTION

Atopic dermatitis (AD) is a chronic inflammatory skin condition affecting about 10% of children and adults in the United States.[1-5] Atopic dermatitis is the most common skin condition in children under 11 years of age.[6] Atopic dermatitis is the most common chief complaint at a pediatric dermatology clinic, disproportionally affecting African Americans.[7] Although AD appears in childhood, AD often persists until adulthood.[8]

Management of AD is difficult due to relapse and high rates of treatment failure. These pitfalls cause children and their families to suffer somatically, psychologically, and financially.[9-12] Atopic dermatitis can cause disfigurement and disability impacting social relationships and quality of life for the child, parent, and adult.[13,14]

Since future research in AD is focused on improving standard-of-care treatment, how AD patients are currently managed is not well characterized. The purpose of this study was to gather insight into the most common treatment regimens prescribed for AD across age group and specialties.[15] Establishing the current standards of treatment may act as a reference for future AD clinical research.

METHODS

Data were obtained from the National Ambulatory Medical Care Survey (NAMCS). The Division of Health Care Statistics of the National Center for Health Statistics conducts the NAMCS to provide data on ambulatory physician office visits in the USA. The NAMCS uses healthcare visits as the base of analysis and reports prescription and nonprescription treatments discussed during the visit. The data are then weighted to obtain nationally representative estimates of ambulatory medical care in the United States.

Atopic dermatitis visits were identified using the ICD-9-CM diagnostic code 691.8 from the years 2006 to 2015. A survey with missing treatment or survey weight and nondermatologic medications were excluded.[16] Frequency tables of age, gender, ethnicity, provider treating AD, and treatment regimens were recorded. Although NAMCS mentioned moisturizers in the treatment regimen, moisturizers are not considered a drug and may not have been formally prescribed; therefore, our results may underrepresent physician's instructions for applying a moisturizer. A more detailed explanation of the methods has been published.[16,17] Statistical analysis was calculated by SURVEYFREQ and SURVEYMEANS using SAS 9.4. The frequency of AD visits per 100 white, African American, and Asian American patients were calculated by dividing the estimated total number of AD visits in each racial population by the total racial census population from 2006 to 2015 and multiplied by 100. The census data was obtained from the United States Census Bureau.[18] Frequency of AD visits per dermatologist, pediatrician, and family physician was calculated by dividing the total number of AD visits in each specialty by the total population of each specialist from 2006 to 2015. Since we were unable to find the specialist population in 2014, the specialist populations from 2013 and 2015 were added and divided by two to receive an average population in 2014. Since we had access to all specialist populations using the AMA and AAMC database, we deferred calculating the midpoint as we believe we could get a more accurate specialist population from the AMA and AAMC data from 2006 to 2015.[19-27] This study was exempt from IRB approval by the Wake Forest Baptist Health Institutional Review Board.

RESULTS

The NAMCS search yielded an estimated 10.4 (95% Confidence Interval [CI]: 9.2, 11.5) million AD office visits from 2006 to 2015. There were approximately an equal number of male visits (51%; 44-58%) and more white race patients (71%; 65-77%) (Table 1). Considering all ambulatory visits from 2006 to 2015, of the white population, 3 out of 1000 ambulatory visits were AD-related; whereas of the African American and Asian American population, 5 out of 1000 and 7 out of 1000 visits were AD-related, respectively. The most common provider managing AD were pediatricians (31%; 24-37%) and other providers (31% of total visits; 24-38%), followed by dermatologists (27%; 22-33%), and family physicians (11%; 6-17%) (Table 1). The frequency of AD visits per dermatologist was 25.5 AD visits per pediatrician, and 1 AD visit per family physician.

TABLE 1.

Percent of Atopic Dermatitis Office Visits in Relation to Gender, Race, and Provider

Demographics	Weighted Percent (%)	95% Confidence Interval
Sex		
Male	49%	42-56%
Female	51%	44-58%
Race		
Malar Area		
White	71%	65-77%
African-American	19%	14-25%
Asian	10%	6-14%
Provider		
Pediatrics	31%	24-37%
Other	31%	24-38%
Dermatology	27%	22-33%
Family Practice	11%	6-17%

The most common medication class prescribed was topical corticosteroids (59%; 52-66%), followed by moisturizers (12%; 8-17%), antibiotics (11%; 6-16%), and second generation antihistamines (6%; 3-10%) (Table 2). Triamcinolone was the most common prescribed topical corticosteroid (prescribed at 25% of office visits; 18-31%), followed by hydrocortisone (19%; 14-24%), desonide (6%; 3-9%), clobetasol (4%; 2-6%), fluocinolone (2%; 1-4%), and desoximetasone (1%; 0-1%) (Table 2). Although moisturizers were mentioned at 12% (8-17%) of AD visits across all age groups, our data may not be a valid observation for moisturizer use. Although moisturizers were mentioned in the NAMCS database, our observations may underrepresent the true physician orders for moisturizer application. Pimecrolimus was prescribed at 6% (1-11%) of visits and cetirizine at 4% (2-7%).

TABLE 2.

Percent of Ambulatory Visits with Topical Corticosteroid Prescriptions

	Ages 0 to 1	95% CI	Ages 2 to 7	95% CI	Ages 8 to 18	95% CI	Ages 19+	95% CI	All Ages	95% CI
Hydrocortisone	7%	3-11%	6%	2-9%	4%	2-7%	2%	1-3%	19%	14-24%
Triamcinolone	6%	2-10%	9%	4-14%	3%	1-5%	7%	4-9%	25%	18-31%
Desonide	3%	1-6%	1%	0-1%	1%	0-3%	1%	0-2%	6%	3-9%
Clobetasol	--	--	<1%	0-1%	1%	0-1%	3%	1-5%	4%	2-6%
Desoximetasone	<1%	0-1%	--	--	<1%	0-1%	<1%	0-1%	<1%	0-1%
Fluocinolone	<1%	0-1%	--	--	<1%	0-1%	1%	0-2%	2%	1-3%

TABLE 3.

Corticosteroid Prescriptions by Specialty				
	Dermatologist	Pediatrician	Family Medicine	Other
Hydrocortisone	28%	42%	8%	22%
Triamcinolone	34%	24%	6%	36%
Clobetasol	64%	8%	8%	20%
Desoximetasone	75%	0%	0%	25%
Fluocinolone	69%	0%	0%	31%

To explore the most common medications prescribed in AD by age group, the sample was divided into four age groups. Hydrocortisone was the most common topical corticosteroid prescribed in AD children <1 year of age and children aged 8 to 18 (prescribed in 7% of office visits [3-11%]; prescribed in 4% of office visits [2-7%];Table 2), and triamcinolone was prescribed most frequently for patients 2 to 7 and 18 and up (9% [5-14%] and 7% [4-9%] of visits, respectively).

Compared to pediatricians and family physicians, dermatologists prescribed more potent topical corticosteroids including triamcinolone (dermatologist 34%; pediatrician 24%; family physician 6%), clobetasol (dermatologist 64%; pediatrician 8%; family physician 8%), and desoximetasone (dermatologist 75%; pediatrician 0%; family physician 0%; [Table 3]).

DISCUSSION

As the prevalence of AD in the United States is rising, African and Asian Americans are disproportionately affected.[28-30] In concordance with a previous study, pediatricians are the most common specialist managing AD in total visits, whereas dermatologists are the most common specialist managing AD per physician.[31,32] Different results between studies may be due to a different sample size and time period.

This study was designed to explore the common medications prescribed for AD by a healthcare provider in an ambulatory setting. Of all topical corticosteroids, triamcinolone was the most common prescription in all outpatient visits. In addition to triamcinolone, hydrocortisone was encouraged as the second most common prescribed topical corticosteroid in AD patient followed by desonide. A similar study of AD visits from 1993 to 2010 reported the most common topical corticosteroid prescribed was hydrocortisone (41%), triamcinolone (22%), and mometasone (10%).[31] In respect from a 1993 to 2015 timeline, we report an increasing trend towards prescribing triamcinolone.[31]

The most common topical corticosteroid in AD children aged 2 to 7 and adults >18 years of age was triamcinolone, whereas children <1 year of age and children aged 2 to 18 were most commonly given hydrocortisone. Hydrocortisone is an appropriate treatment of choice in children less than 1 year of age as potency and pharmacokinetic properties in this age group favor the use of low potency corticosteroids.

Moisturizers are an integral component in AD management. In spite of its importance, a provider's instruction for using a moisturizer was not mentioned in our report because the NAMCS is not an appropriate platform to gather such information. Although the NAMCS gathers drugs mentioned during a clinical encounter, by definition, a moisturizer is not a drug. As such, our data cannot definitively state the instructing patterns of moisturizer use in healthcare providers.[16]

Although second generation antihistamines were the second most common prescribed medication class for AD from 2006 to 2015, their use in the management of AD is not recommended, as per the guidelines.[33] Furthermore, second generation antihistamines have little evidence for their efficacy in the management of AD.[34]

Limitations of the present study include inability to follow the patient longitudinally and discover their health outcome. Although we are able to speculate practice gaps in NAMCS database, disease severity and treatment outcome is not provided. Disease severity was not reported through NAMCS; therefore, we do not have the rationale for initiating certain treatments. The NAMCS only captures prescription and nonprescription medications mentioned during a visit, therefore AD patients with previously prescribed topical corticosteroids from the previous visit may not need a prescription during the next visits. Finally, moisturizers are not considered pharmaceutical products, therefore their perceived versus actual use cannot be definitively reported using the NAMCS.[16,17]

DISCLOSURES

Dr. Steven Feldman is a speaker for Janssen and Taro. He is a consultant and speaker for Galderma, Stiefel/GlaxoSmithKline, Abbott Labs, Leo Pharma Inc. Dr. Feldman has received grants from Galderma, Janssen, Amgen, Stiefel/GlaxoSmithKline, Celgene and Anacor. He is a consultant for Amgen, Baxter, Caremark, Gerson Lehrman Group, Guidepoint Global, Hanall Pharmaceutical Co Ltd, Kikaku, Lilly, Merck & Co Inc, Merz Pharmaceuticals, Mylan, Novartis Pharmaceuticals, Pfizer Inc, Qurient, Suncare Research and Xenoport. He is on an advisory board for Pfizer Inc. Dr. Feldman is the founder and holds stock in Causa Research and holds stock and is majority owner in Medical Quality Enhancement Corporation. He receives Royalties from UpToDate and Xlibris.

Dr. Adrian Pona, Sree S. Kolli, and Dr. Abigail Cline have no conflicts to disclose.

Alan Fleischer is former employee of Abbvie and a consultant for Qurient, Inc and Dermavant.

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