Patterns of Clinical Management of Atopic Dermatitis in Infants and Toddlers: A Survey of Three Physician Specialties in the United States☆

José M. Saavedra, MD[1,4], Mark Boguniewicz, MD[2], Sarah Chamlin, MD[3], Alan Lake, MD[4], Susan Nedorost, MD[5], Laura A. Czerkies, MS, RD[1], Vardhaman Patel, MS[6,7], Marc F. Botteman, MSc, MS[6], and Erica G. Horodniceanu, BS[6]

Objective To describe atopic dermatitis (AD) management patterns in children ≤36 months old as reported by pediatricians, dermatologists, and allergists in the US.

Study design A nationally-representative survey was administered to pediatricians (n = 101), dermatologists (n = 26), and allergists (n = 26). Main outcomes included referrals to health care professionals, suggested/ordered laboratory tests, management approach (dietary, pharmacologic, or combination of both) by age, AD location, and severity.

Results Significant differences were observed in referrals to healthcare professionals ($P < .001$). Pediatricians more frequently referred to dermatologists than allergists in mild (52.4% vs 32.0%) and moderate/severe (60.6% vs 38.1%) cases. Dermatologists referred to allergists less frequently for mild (9.1%) than moderate/severe (40.7%) AD cases. Pediatricians (59%), allergists (61.5%), and dermatologists (26.9%) reported treating at least some of their patients with AD with dietary management (infant formula change) alone (with or without emollients). Soy-based formulas were often used. For mild AD, the most commonly reported first-line pharmacologic treatments included topical emollients, topical corticosteroids, and barrier repair topical therapy/medical devices. Over 80% of physicians used a dietary and pharmacologic combination approach. Dermatologists were most likely to manage AD symptoms with a pharmacologic-only approach. AD lesion location influenced pharmacologic treatment in >80% of physicians.

Conclusions Significant and distinct differences in AD treatment approach exist among physicians surveyed. Most pediatricians and allergists use formula change as a management strategy in some patients, whereas dermatologists favor a pharmacologic approach. This diversity may result from inadequate evidence for a standard approach. Consistent methods for managing AD are needed. *(J Pediatr 2013;163:1747-53)*.

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Atopic dermatitis (AD), a pruritic chronic inflammatory skin disease commonly found in the pediatric population,[1-3] is the most common chronic disease of early infancy, affecting up to 20% of children worldwide,[4] with prevalence increasing particularly in children ages 6-7 years.[5] AD typically presents in infancy or before age 5 years in 60%-65%[6,7] and 85%[7] of cases, respectively.

AD imposes substantial burden on patients, caregivers, and society, impacting quality of life and associated costs. Its national direct medical cost ranges from US$0.9 to US$3.8 billion.[8] Quality of life concerns include itching and scratching and disturbances in sleep, school performance, and behavior.[9-11] Families of children with AD suffer from sleep loss, exhaustion, stress, depression, missed work, and lifestyle restrictions,[9-11] a burden previously reported to be greater than in diabetic families.[12]

Diagnosis is based on clinical features, including pruritus, typical morphology and distribution, a chronic or relapsing dermatitis, and personal or family history of atopy.[1] In the absence of laboratory diagnostic tests specifically for AD, allergy tests can be useful in supporting the diagnosis. AD management goals include symptom reduction and flare prevention.[13,14] Combination use of emollients and topical corticosteroids remains the common first-line therapeutic approach in children.[11,14]

Cow's milk protein is the most common AD-associated food allergen. Studies have demonstrated the potential of hydrolyzed infant formulas to reduce AD risk in infants with familial history of intact cow's milk protein allergy.[15-19] However,

AD	Atopic dermatitis
EHF	Extensively hydrolyzed formula

From the [1]Nestle Nutrition, Florham Park, NJ; [2]University of Colorado School of Medicine, Denver, CO; [3]Northwestern University Feinberg School of Medicine, Chicago, IL; [4]Johns Hopkins University, Baltimore, MD; [5]Case Western Reserve University, Cleveland, OH; [6]Pharmerit International, Bethesda, MD; and [7]University of Illinois, Chicago, IL

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dietary approaches for treating pediatric AD have not been well-studied. Food challenge is the gold standard for proving food allergy as a cause of AD flares. It should be conducted in a controlled environment over several days, but this is costly and impractical. The resultant lack of clear evidence for best practice has yielded many dietary recommendations for AD.

The primary objective of this study was to describe management patterns, including referrals, laboratory test use, and treatment approach (pharmacologic, dietary, and combined) for mild and moderate/severe AD in children ≤36 months old as reported by pediatricians, dermatologists, and allergists in the US.

Methods

A convenience sample of 3 physician specialties (general pediatricians [pediatricians], pediatric dermatologists [dermatologists], and allergist-immunologists [allergists]) practicing in the US was identified using an internet-based process, utilizing multiple databases and compendiums, including the American Medical Association's State Medical Licensure Requirements and Statistics compendium and the American Board of Medical Specialties Directory. Recruitment (via opportunistic approach) sought to identify 100 pediatricians, 25 dermatologists, and 25 allergists, with the majority located in the 25 most populous states.

The survey contained 647 questions (closed-end, multiple-choice), organized into 15 sections, exploring components of AD management of patients ≤36 months old. Skip logic and patterns were used to minimize participant burden. Questions assessed physician characteristics, referral patterns, laboratory test use, emollient use, treatment approach (based upon age, severity, and symptom location), reoccurrence, and hospitalization. Additional questions aimed to quantify AD treatment-associated costs; these data are being evaluated separately. The survey was developed and fielded by Pharm*Ideas* Research and Consulting Inc (Ontario, Canada) with guidance from a co-investigator panel with expertise in pediatrics, dermatology, and allergy-immunology. Data collection occurred from March-November 2011. Participants were compensated monetarily for time spent completing the survey.

Questions were asked according to AD severity, AD lesion location, patient age, and treatment approach. Although exclusive breastfeeding is recommended for the first 6 months,[20] questions regarding dietary management were defined as formula changes and were limited to infants (<12 months old) not exclusively breastfed. Pharmacologic approach was defined as prescribing or suggesting active medications. A formal definition of "mild" and "moderate/severe" AD was not provided. Participants were asked to use clinical judgment based on personal assessment of disease severity.

Outcomes of interest reported herein include referrals to other health care professionals, laboratory tests ordered or suggested, management approach (pharmacologic, dietary, or combined treatment with both) in patients by age (<12 months or 12-36 months), by AD location (face or trunk and extremities) in patients <12 months of age, and by disease severity (mild and moderate/severe). Response options pertaining to laboratory tests, overall AD management approach in patients <12 months of age, and AD symptom location were provided as percentage ranges. Questions that received infrequent responses such as use of atopy patch testing and skin swabs for bacterial culture and sensitivity were not included in summary data.

Statistical Analyses

Analyses (nonparametric for nominal and ordinal data) were performed with SAS (v. 9.2, SAS Institute, Cary, North Carolina). Monte Carlo simulation of Kruskal–Wallis exact test (for ordinal data) and Fisher exact test (for nominal data) assessed differences among pediatricians, dermatologists, and allergists. An α of 0.05 was the maximum acceptable probability of Type-I error for omnibus significance tests. When P values for the omnibus significance tests indicated significance, multiple-group comparisons tested for response differences between pediatricians and dermatologists, pediatricians and allergists, and dermatologists and allergists. Monte Carlo simulation of Wilcoxon rank-sum test and Fisher exact test were used for multiple group comparisons when responses were ordinal or nominal, respectively. Bonferroni correction method was used to adjust alpha (adjusted $\alpha = 0.016$) for post-hoc, multiple-group comparisons.

Results

Of 1862 physicians identified, 153 (8.2%) participated in the survey, with 55.6% being male. Two-thirds were pediatricians, and dermatologists and allergists were equally represented. Most (92.8%) were practicing for >5 years and were located primarily in the South (37.3%), West (24.8%), and Midwest (22.9%) regions. Every state (including the District of Columbia) was represented by ≥1 participant, with the vast majority of states providing 2 participants. Eighty percent treated >50 patients with AD during the past 12 months, with 69.2% of dermatologists treating >200 patients. Over one-half of all participants reported that >50% of their patients were ≤3 years old. Within this age group, 78.4% of participants characterized over one-half of their patients as having mild AD and 21.5% reported over one-half as having moderate/severe AD. The proportion of moderate/severe AD cases was higher among dermatologists and allergists vs pediatricians ($P < .001$).

Dermatologists reported treating more patients with AD vs pediatricians and allergists. Even though most pediatricians (81.2%) had seen patients for initial care, most dermatologists (84.6%) and allergists (69.2%) had seen patients for both initial and subsequent care. Of the dermatologist and allergist referrals, most were referred by medical professionals. Conversely, most patients referred to pediatricians were referred by a friend or family or were self-referred ($P < .001$).