

Pediatric residents' assessment of atopic dermatitis severity for risk assessment of early peanut introduction



Atopic dermatitis (AD), often referred to as eczema, is 1 of the most common skin disorders affecting the pediatric population.¹ Although pediatricians diagnose eczema frequently, classification of severity can be challenging, because score-based indices (eg, The Eczema and Area Severity Index [EASI], Scoring Atopic Dermatitis [SCORAD] index) are complicated and designed primarily for use in clinical trials. These instruments are used infrequently by general pediatricians and may be associated with discrepancies in AD classification between providers.² Accurate assessment of AD severity is critical to assist pediatricians in following the 2017 Addendum Guidelines for the Prevention of Peanut Allergy in the United States.³ Thus, this study aimed to characterize the factors that pediatric residents use to assess AD severity.

As part of a study performed at the Ann and Robert H. Lurie Children's Hospital of Chicago affiliated with Northwestern University, pediatric residents ($n = 41$) who had diagnosed AD in 4- to 9-month-old infants during well child visits were surveyed on which factors they have ever used and the most important factor to classify disease severity. Response options included percent body surface area (BSA) affected, previous diagnosis of severe AD by another physician, need for prescription-strength medication, intensity of AD, subjective signs (pruritus and sleep disruption), history of secondary infection, history of AD-related emergency department (ED) visits or hospitalizations, and referral to dermatology specialists. Descriptive statistics were used to analyze the data.

Results of the survey are presented in Table 1. Factors most frequently used to categorize the severity of AD were disease intensity (eg, degree of erythema, oozing, crusting, thickening) (92.7%), percent BSA affected (85.4%), need for prescription-strength medication (61%), need for dermatology specialist referral (68.3%), and history of AD-related ED visits or hospitalizations (58.5%). Previous diagnosis of severe AD by another physician (39%) and subjective symptoms such as nighttime awakening and pruritus (31.7%) were the least frequently used. Factors rated as most important by residents were AD intensity (61%), followed by percent BSA involved (14.6%).

The current study is essential to understand the gap regarding the objective assessment of the severity of AD in daily practice to accurately follow the 2017 National Institute of Allergy and Infectious Diseases (NIAID) guidelines for prevention of peanut allergy. The data from this study emphasize that an accurate assessment of AD severity is required for pediatricians to use the current NIAID guidelines for peanut introduction. Standardizing clinical assessment strategies and creating a practical scoring system to detect eczema

severity can help diminish misclassification of AD severity caused by lack of standardization on how to examine and document the severity of eczema in daily practice.

In the current study, pediatric residents used the disease intensity of AD as the most important factor when classifying severity, followed by percent BSA affected. These factors successfully correlate with 2 categories of the SCORAD Index, "Intensity" and "Extent," which are mostly used to determine the severity of AD for research studies.^{2,4} Subjective patient- or caregiver- reported factors were least frequently used to determine severity, which also correlates with the previous studies reporting that the end result of the SCORAD index is influenced by widely divergent gradings of the subjective items by caregivers or patients.² Moreover, it is associated with discrepancies in the classification of AD severity among providers.^{2,5} Objective SCORAD, which uses only objective criteria, including the intensity and extent of AD, has also been used in different studies; however, a study done by Hon et al⁶ demonstrated that misestimation of the intensity may tremendously alter the severity grading of this measure. Conversely, EASI has been determined as the preferred core instrument over the objective SCORAD index for AD trials by the global Harmonising Outcome Measures for Eczema initiative.⁷ However, the use of EASI in daily practice is still problematic because of the extent and complexity of the scoring system.

The Patient-Oriented Eczema Measure has been developed to measure AD severity from the patients' perspective by inquiring the frequency of common symptoms reported by patients.⁸ Although the Patient-Oriented Eczema Measure was reported as a time-efficient tool that can be applied to daily practice,⁹ it still lacks the consideration of body surface area when examining AD severity, which was also identified as the second most important and commonly used factor in the current study. Strikingly, BSA is reported to have the same strength of correlation with overall AD severity as EASI and SCORAD, and outcome measures that include BSA correlate better with overall AD severity.¹⁰

Of note, although the data in the current study are helpful for understanding the trends surrounding the determination of AD severity in pediatric clinics, further studies are still needed to improve the understanding of factors used by practicing pediatricians who may have more expertise in examining patients with AD.

In conclusion, accurate classification of the severity of infantile AD is extremely important when it comes to recommending early introduction of peanut-containing products vs further testing before such introduction. Great need exists for an easier and more sensitive

Table 1
Factors Used to Classify Severity of AD by Pediatric Residents (N = 41)

Factors used to determine AD severity	Any factor used to determine severity n (%)	Most important factor used to determine severity n (%)
Percent body surface area affected	35 (85.4%)	6 (14.6%)
Diagnosed as severe by another physician	16 (39.0%)	0 (0%)
Need for prescription-strength medication	25 (61%)	4 (9.8%)
Intensity (eg, degree of erythema, swelling, oozing, crusting, scratch marks, skin thickening, and dryness)	38 (92.7%)	25 (61%)
Subjective signs (pruritus, sleep disruption)	13 (31.7%)	0 (0%)
History of superinfection	20 (48.8%)	0 (0%)
History of ED visits or hospitalizations because of AD	24 (58.5%)	4 (9.8%)
AD requiring dermatology specialist referral	28 (68.3%)	2 (4.9%)
Other	0 (0%)	0 (0%)

Abbreviations: AD, atopic dermatitis; ED, emergency department.

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scoring system in daily practice, especially in light of updated recommendations for peanut introduction. An easy-to-use AD classification system incorporating the intensity and percent BSA may help pediatricians standardize their assessment of disease severity and improve accurate application of the guidelines for the prevention of peanut allergy.

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The Amish have decreased asthma and allergic diseases compared with old order Mennonites



The prevalence of allergic diseases is increasing worldwide, particularly in Westernized regions. Epidemiologic studies from several continents have shown an association between infants born into farming environments and significantly decreased frequency of asthma and allergic diseases. The protective factors in farming environments remain poorly understood but may include animal exposure and farm (unprocessed) milk ingestion.^{1,2} The Amish, Old Order Mennonites (OOM), and Hutterites are distinct Anabaptist traditional agrarian cultures. Studies of Amish and OOM have separately reported a decreased prevalence of allergic respiratory diseases compared with existing databases of non-Anabaptist populations.^{3,4} Although the contrast in allergic respiratory disease prevalence between Anabaptist and non-Anabaptist populations may be attributable to lifestyle or genetic differences, significant differences in the risk for respiratory allergic diseases also have been observed between the mutually traditional and genetically similar Amish and Hutterite groups.⁵ These observations suggest that within traditional and genetically similar agrarian communities, the risk for respiratory allergic disease can vary greatly. Identifying which farming communities have increased protection against allergic diseases and understanding what factors are relevant in promoting protection is critical for understanding the mechanisms of allergic sensitization and development of rational and safe primary prevention strategies for the general public.

We sought to determine the prevalence of a broad range of allergic diseases in the Amish and the OOM in Wisconsin. The Amish and OOM are of Swiss German ancestry, with origins in the Anabaptist movement during the 16th century in Europe. These distinct groups had similar immigration patterns to North America starting

in the 18th century. Both groups seek to live separately from society and practice a traditional agrarian lifestyle in overlapping geographical regions of Wisconsin. A cross-sectional paper survey was developed and distributed to Amish and OOM families in Wisconsin, as previously described.⁶ The allergic disease and farm-related survey questions were modified from the National Health and Nutrition Examination Survey and Multidisciplinary Study to Identify the Genetic and Environmental Causes of Asthma in the European Community (GABRIEL) Advanced Study questionnaires, respectively.^{7,8} Analyses were conducted using SAS software (SAS Institute Inc., Cary, North Carolina) version 9.4. All *P* values were 2-sided, and *P* < .05 was used to define statistical significance.

A total of 1,741 surveys were distributed from August 2014 until March 2016, of which 518 surveys were received (29.9% response rate), representing over 4,200 individuals. Most households consisted of married couples with children, with the mean number of children per household significantly higher for Amish compared with OOM (6.56 ± 4.14 vs 5.23 ± 3.39, respectively; *P* = .0025). The OOM group had a lower frequency of raw milk ingestion and farm residence compared with the Amish. However, most Amish and OOM respondent families live on a farm and reported consumption of raw unprocessed farm milk, including during pregnancy. Amish families reported significantly smaller farm size and fewer animals compared with OOM (84% of Amish have 1–25 cows, goats, or sheep compared with 7% of OOM households; eTable 1).

At the household level, Amish families reported an overall allergic disease prevalence of 26.4% (*n* = 92 households, data available from 348 households), and OOM reported a significantly higher prevalence of 46.7% (*n* = 35 households; data available from 75 households, *P* = .0008). More than 1 affected family member was reported in 33.6% of Amish families, compared with 48.6% of OOM families with allergic disease. At the individual level, Amish reported significantly less self-reported and health care professional–diagnosed asthma, eczema, hay fever, and food allergies compared with OOM (Fig 1). No significant difference was seen in the age range of reported allergic disease-affected individuals between the Amish and OOM (Amish: mean age 33 years ± 18.2; OOM: mean age 27 years ± 14.5).

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