Practical Strategies for the Diagnosis and Assessment of Atopic Dermatitis

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Abstract

Atopic dermatitis (AD) has a significant, lifelong clinical impact on affected individuals and has profound effects on quality of life both for patients and their families. The diagnosis usually can be reliably established on the basis of the history and physical examination. In patients with skin of color, blanching of the skin may be helpful to detect erythema, lichenification, follicular accentuation, and hypopigmentation (all of which are more common than in lighter-skinned patients). Once the diagnosis of AD is established, an assessment of severity, persistence, and impact on the patient's and family's life is important as a guide to treatment decisions.

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Keywords

Atopic dermatitis; eczema

The prevalence of atopic dermatitis (AD) in the United States is about 3% to 5% in the overall population, or approximately 15 million children and adults. The current lifetime prevalence of AD in childhood is estimated to be 10% to 15%, which is an increase of 6% to 10% over the last 30 years.[1-5]

In addition, AD prevalence among children differs according to geography. In the United States, prevalence varies markedly by region, from a low of 8.7% in Florida to a high of 18.05% in Maryland.[6] These differences may be the result of environmental and other factors such as sun exposure, baseline humidity, and urban/rural gradients.[7]

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Diagnosis of AD

The diagnosis of patients with characteristic signs and symptoms of AD usually does not present a clinical challenge. The typical findings include pruritus, erythema, papules/vesicles, xerosis, excoriations, erosions, and, in many cases, lichenification and dyspigmentation. Questioning during the history taking also provides important diagnostic information: Is the rash chronic or atypical (suggesting another diagnosis or the presence of a comorbid condition)? Does the rash flare and remit (the hallmark history in a patient with AD)? Finally, a positive family history for AD—in either or both parents—increases the likelihood that a child has AD.

The characteristic, age-related anatomic distribution of AD provides further evidence to support the diagnosis.[8,9] In infants, the face (particularly the cheeks and chin), trunk, and extensor extremities are the most common sites of involvement, with sparing of the diaper area. In toddlers and older children, the most commonly affected sites are the flexoral areas of the wrists, ankles, and antecubital and popliteal fossae. In adolescents and adults, the wrists, hands, neck, and ankles are typically affected.

Several clinical features may be associated with AD and may suggest or support the diagnosis (**Table 1**), although their presence is not specific for AD.[10]

Differential Diagnosis

In the few cases in which the diagnosis of AD cannot be determined clinically, a number of other common disorders may be considered in the differential diagnosis (**Table 2**).

Seborrheic dermatitis (cradle cap) is particularly common in infants from birth to 6 months of age, and represents a potentially confounding finding, as seborrheic dermatitis and eczematous dermatitis often cannot be differentiated in this age group. Diffuse cradle cap in the presence of eczematous dermatitis on the arms and cheeks may resolve over time or may evolve into AD, despite eventual clearance of the cradle cap.

TABLE 1 Findings Possibly Associated With Atopic Dermatitis

The presence of the following conditions may be associated with atopic dermatitis (AD), although they are not specific for AD:
Hyperlinear palms
Ichthyosis
Keratosis pilaris
Ocular or periorbital changes
Perifollicular accentuation
Pityriasis alba
Prurigo lesions

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Contact dermatitis is an alternative diagnosis, or it may be a comorbid condition. Careful questioning of the caregiver regarding exposure to potential irritants can help determine whether contact dermatitis might be the culprit or a contributor, and contact allergy testing may be necessary.

Nummular dermatitis can present with discreet, annular pruritic eczematous plaques, often with crusting.

The other common disorders in the differential diagnosis usually can be recognized and distinguished from AD based on characteristic signs, symptoms, and history.

Some findings and differences from typical atopic dermatitis disease course should prompt consideration of a broader differential diagnosis than atopic dermatitis, depending on a patient's age (summarized in **Table 3**). In an infant or young child, consideration of a differential diagnosis of rare disorders—metabolic, nutritional, genetic, immune, and proliferative conditions (**Table 4**)—becomes especially important when a growth curve abnormality/failure to thrive is noted, when multiple cutaneous and/or systemic infections occur, when the morphology or distribution of a rash is unusual, when a patient's response to typical AD treatment is poor, or when fixed-plaque hypopigmentation is treated and then recurs in the same site and in the same configuration, which suggests the possibility of cutaneous T-cell lymphoma.

In adults, late-onset AD signs and symptoms should prompt consideration of other diagnoses in addition to AD (**Table 5**).

TABLE 2 Differential Diagnosis of Atopic Dermatitis: Common Disorders

Contact dermatitis (allergic and irritant)
Ichthyosis vulgaris
Keratosis pilaris
Nummular dermatitis
Psoriasis
Scabies
Seborrheic dermatitis
Tinea corporis

TABLE 3 Findings Which Should Prompt Reconsideration of the Diagnosis of Atopic Dermatitis in Infants and Young Children

Failure to thrive
Multiple infections, cutaneous and/or systemic
Unusual morphology or distribution of rash
Poor response to typical atopic dermatitis (AD) treatments
Fixed-plaque hypopigmentation
Late-onset AD signs/symptoms

Clinical Variations in AD in Skin of Color

In patients with Fitzpatrick skin types IV, V, and VI, the cutaneous signs that are classic for AD in patients with lighter skin may not be evident (**Figure**). For example, erythema can be especially hard to detect on simple visual inspection (redness may be appreciated on skin blanching).

Lichenification and follicular accentuation are more common in skin of color, as are hypopigmentation and/or hyperpigmentation. In some cases, hypopigmentation can be profound, causing patients and families to be concerned that the change in skin coloration represents scarring and/or a side effect of a topical medication. They should be reassured that pigment changes associated with AD are common and are the result of inflammation in the skin.

In addition, certain features of AD, such as xerosis, may have a different appearance in skin of color. The presence of some nonspecific findings that may be associated with AD can be helpful in making the diagnosis in patients with darker skin.

Pityriasis alba is commonly seen in individuals with dark skin, although it may occur in these patients in the absence of AD. *Perifollicular accentuation* and *prurigo lesions* also are common in patients with skin of color. Because filaggrin mutations are associated with hyperlinear palms and a tendency toward skin dryness, *hyperlinearity* suggests a diagnosis of AD.

TABLE 4 Rare Disorders to Be Considered in the Differential Diagnosis of Atopic Dermatitis in Infants and Children

Metabolic/nutritional/genetic disorders
Acrodermatitis enteropathica
Eosinophilic gastroenteritis
Gluten-sensitive enteropathy
Hurler syndrome
Netherton syndrome
Omenn syndrome
Other nutritional deficiencies (biotin, essential fatty acids)
Phenylketonuria
Prolidase deficiency
Zinc deficiency (prematurity; deficient breast milk zinc; cystic fibrosis)
Immune disorders
Agammaglobulinemia
Ataxia-telangiectasia
Hyperimmunoglobulin E syndrome
Neonatal lupus erythematosus
Severe combined immunodeficiency disorder
Wiskott-Aldrich syndrome
Proliferative disorders
Langerhans cell histiocytosis

TABLE 5 Rare Disorders to Be Considered in the Differential Diagnosis of Atopic Dermatitis in Adolescents and Adults

Cutaneous T-cell lymphoma (mycosis fungoides, Sézary syndrome)
Dermatomyositis
Drug eruptions
Graft-versus-host disease
HIV-associated dermatoses
Lupus erythematosus
Pemphigus foliaceus

HIV=human immunodeficiency virus.

Assessment of AD

Once the diagnosis of AD is established, an assessment of severity, persistence, and impact on the patient's and family's life is important as a guide to treatment decisions.

Clinical Assessment

Severity. About one-third of children with AD have severe disease, which can be predicted by three main factors: onset of signs and symptoms before 1 year of age, the presence of a filaggrin gene mutation, and concomitant immunoglobulin E (IgE) sensitization early in life. The degree of severity is judged on the basis of extent of involvement (the body surface area affected), qualities of the lesions, the persistence of the disease, and the impact of AD on a patient's and family's quality of life.

Persistence is defined by cycles of remission and relapse of signs and symptoms. Patients whose AD responds readily to standard treatment modalities and who experience prolonged periods of remission with occasional flares of signs and symptoms are considered to have less severe disease than those whose AD is difficult to bring under control and who relapse frequently.

Impact of disease. Clinicians should ask questions that probe quality-of-life challenges for the patient and the family, such as sleep disturbance, interference with school and/or work, effects on relationships, and disruption of family life.

Assessment Tools and Laboratory Tests for AD

Tests of AD severity that have been developed for use in clinical trials—the Eczema Area and Severity Index (EASI) and SCORing Atopic Dermatitis (SCORAD)—and patient assessment measures such as the Patient-Oriented Eczema Measure (POEM) and the Patient-Oriented SCORing Atopic Dermatitis (PO-SCORAD) take a great deal of time to use and may not be suitable for use in clinical practice.

Laboratory tests that are sometimes performed to assess AD—namely, IgG testing for food allergies and gluten sensitivity testing—are of no clinical value. In the past, some clinicians had advocated the use of allergen-specific IgE tests as part of an assessment for allergies that might be "causing the eczema," but more recent studies have demonstrated that these tests have poor predictive value, with a high probability of false-positive results. Studies have shown IgE testing for food allergy to have poor predictive value, with skin-prick tests only marginally more useful.[11,12] These tests may be useful when evaluating for specific food responses in suspected allergies.

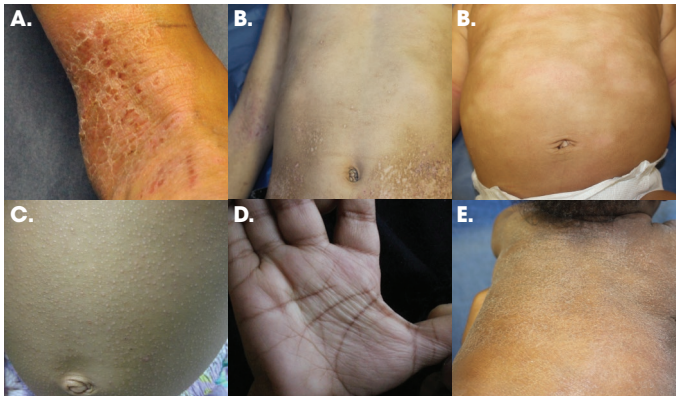

FIGURE Lichenification (A), Hypopigmentation (B), Perifollicular Accentuation (C), Palmar Hyperlinearity (D), Xerosis (E)

Source: Photos courtesy of Lawrence F. Eichenfield, MD.

Follow-Up Evaluation: Practical Questions

At follow-up visits, useful information can be obtained about recent routines for skin care and medication use during the previous week, rather than just asking about use since the last visit. In assessing topical medication use, it is often helpful to ask how long a tube of the patient's medication lasts.

Other questions should elicit information relating to the period since the last visit, including the last time the patient's skin was totally clear, whether any systemic medications (such as oral prednisone) have been prescribed by another clinician, and whether the patient has been hospitalized for any reason or has been seen by a clinician in another specialty, such as an allergist.

Finally, each clinical interaction should include an assessment of how the patient and/or the family think about AD. The simple question "What are you afraid of concerning this skin condition?" can elicit a focused answer with useful information.

Conclusion

Atopic dermatitis is a common condition that is usually easy to diagnose clinically, although considerations of a broader differential diagnosis are appropriate when the history, clinical course, or response to therapy are atypical. Evaluations of AD should include assessment of disease severity, persistence, response to therapies, and disease impact on the individual and family.

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