PRACTICAL DIAGNOSIS OF PEDIATRIC ATOPIC DERMATITIS

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Atopic dermatitis

I have worked with the following organizations:

- Abbvie (PI)
- Arcutis (PI)
- Galderma (Sp)
- Krystal Biotech (PI)
- Novan (PI)
- Pfizer (PI, Sp)
- Pierre Fabre (Sp, C)
- Regeneron Pharmaceuticals (PI, Sp, C)
- Sanofi-Genzyme (Sp, C)
- Unilever, Inc (C)
- Verrica Pharmaceuticals, Inc (PI, Sp, C)

PI: Principal Investigator; Sp: Speaker; C: Consultant
Atopic dermatitis

OBJECTIVES

• Strategies for the practical diagnosis and assessment of pediatric AD
• Differential diagnosis
• Clinical presentation
• Assessment of AD: practical assessment tools and approaches
Atopic Dermatitis (AD)

- Most common type of eczema
- The most common chronic inflammatory skin condition worldwide
- Affects 10–20% of schoolchildren in the US
  - 65% develop symptoms in first year of life
  - 90% before the age 5 years
- Significant adverse impact on the quality of life

Diagnosis of AD is based on clinical features

- No biopsy is necessary
- No biomarkers widely used
- Elevated total and/or allergen specific serum IgE level in most patients with AD
  - Not present in 20% of affected individuals
  - Present in 55% of the general population
  - May be a secondary phenomenon
  - Total IgE level does vary with disease severity
  - Not a reliable indicator
  - Some with severe disease have normal values
- The future – tape strip profiling of skin for biomarkers

### Clinical Diagnostic Criteria - Atopic Dermatitis

#### Essential Features
**MUST be present**
- Pruritus
- Eczema (acute, subacute, chronic) typical morphology and age-specific patterns*
- Chronic or relapsing history

*Patterns include: Facial, neck and extensor involvement in infants and children; Current or previous flexural lesions in any age group; Sparing of the groin and axillary regions

#### Important Features
**Seen in most cases; add support to AD diagnosis**
- Early age of onset
- Atopy
  - Personal and/or family history
  - Immunoglobulin (Ig) E reactivity
- Xerosis

#### Associated Features
**Help to suggest AD, but not specific enough to use in research or epidemiological studies**
- Atypical vascular responses (e.g., facial pallor, white dermographism, delayed blanch response)
- Keratosis pilaris/pityriasis alba/hyperlinear palms/ichthyosis
- Ocular/periorbital changes
- Other regional findings (e.g., perioral changes, periauricular lesions)
- Perifollicular accentuation/lichenification/prurigo lesions

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AD: Age specific distribution pattern

- Infantile (~ 3mo - ~ 2 years)
  - Face
  - Extensor surfaces of arms, legs
- Childhood (~ 2 years – puberty)
  - Flexural
- Adolescents/Adults
  - Neck
  - Hands

AD on different skin types
Who is At Risk for AD?

- Family history of AD, asthma, or hay fever\(^1\)
  - 1 affected parent = 60% chance
  - Both parents affected = 80% chance
- FLG gene mutations\(^1\)
- Male:Female ratio 1:1.5\(^2\)
- Higher incidence in Blacks and Asians vs Caucasians in US\(^2\)
- Living in urban environments\(^1\)

- Asthma, allergic rhinoconjunctivitis (hay fever) or food allergies
- Asthma
  - 2x more likely
- Environmental allergies
  - ~ 2x more likely
- Food allergies
  - 5x more likely

Silverberg JI, Simpson EI. Pediatr Allergy Immunol 2013;24:476-486
The atopic march
• Seborrheic dermatitis
• Contact dermatitis
• Psoriasis (esp palmoplantar)
• Scabies
• Dermatophytosis
• Primary immunodeficiencies
• Acrodermatitis enteropathica
• Other nutritional deficiencies
<table>
<thead>
<tr>
<th>Tool</th>
<th>What is Assessed</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>EASI</td>
<td>Physician estimates of AD extent and severity (redness, thickness/induration, scratching, lichenification/prurigo)</td>
<td>0 — 72 (Mild-Severe)</td>
</tr>
<tr>
<td>IGA</td>
<td>Physician assessment of overall appearance of lesions</td>
<td>0 — 4 (Clear-Severe)</td>
</tr>
<tr>
<td>SCORAD</td>
<td>Physician estimates of extent and severity (erythema, edema/papulation, excoriations, lichenification, oozing/crusts and dryness) Patient assessment of itch and sleep loss</td>
<td>0 — 103</td>
</tr>
<tr>
<td>CDLQI</td>
<td>Measures the impact of any skin disease on the lives of children</td>
<td>0-30</td>
</tr>
<tr>
<td>POEM</td>
<td>Severity from patient perspective 7 questions assess symptoms and frequency</td>
<td>0 — 28</td>
</tr>
</tbody>
</table>

EASI, Eczema Area and Severity Index; IGA, Investigator’s Global Assessment; POEM, Patient Outcomes Eczema Measure; SCORAD, SCORing Atopic Dermatitis CDLQI: Childrens Dermatology Life Quality Index
<table>
<thead>
<tr>
<th>SCORE</th>
<th>CATEGORY</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Clear</td>
<td>No signs of inflammatory AD</td>
</tr>
<tr>
<td>1</td>
<td>Almost Clear</td>
<td>Faint, barely detectable erythema and/or trace residual elevation in limited areas; neither excoriatiob nor oozing/crusting are present</td>
</tr>
<tr>
<td>2</td>
<td>Mild</td>
<td>Light pink erythema and slightly perceptible elevation; excoriatio, if present, is mild</td>
</tr>
<tr>
<td>3</td>
<td>Moderate</td>
<td>Dull red, clearly distinguishable erythema and clearly perceptible elevation but not extensive; excoriatiob or oozing/crusting, if present, are mild to moderate.</td>
</tr>
<tr>
<td>4</td>
<td>Severe</td>
<td>Deep/dark red erythema, and marked and extensive elevation; excoriatiob and oozing/crusting are present.</td>
</tr>
</tbody>
</table>
EASI Scoring System

EASI score ranges from 0-72

<table>
<thead>
<tr>
<th>Intensity</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redness</td>
<td><img src="image1" alt="Score 0" /></td>
<td><img src="image2" alt="Score 1" /></td>
<td><img src="image3" alt="Score 2" /></td>
<td><img src="image4" alt="Score 3" /></td>
</tr>
<tr>
<td>Thickness/induration</td>
<td><img src="image5" alt="Score 0" /></td>
<td><img src="image6" alt="Score 1" /></td>
<td><img src="image7" alt="Score 2" /></td>
<td><img src="image8" alt="Score 3" /></td>
</tr>
<tr>
<td>Scratching</td>
<td><img src="image9" alt="Score 0" /></td>
<td><img src="image10" alt="Score 1" /></td>
<td><img src="image11" alt="Score 2" /></td>
<td><img src="image12" alt="Score 3" /></td>
</tr>
<tr>
<td>Lichenification/prurigo</td>
<td><img src="image13" alt="Score 0" /></td>
<td><img src="image14" alt="Score 1" /></td>
<td><img src="image15" alt="Score 2" /></td>
<td><img src="image16" alt="Score 3" /></td>
</tr>
</tbody>
</table>
SCORAD (SCORing Atopic Dermatitis)
The aim of the questionnaire is to measure how much your skin problem has affected you OVER THE LAST WEEK. Please ✔ one box for each question.

1. How itchy, scratchy, sore or painful has your skin been?

2. How upset or embarrassed, self conscious or sad have you been because of your skin?

3. How much has your skin affected your friendships?

4. How much have you changed or worn different or special clothes/shoes because of your skin?

5. How much has your skin trouble affected going out, playing or doing hobbies?

6. How much have you avoided swimming or other sports because of your skin trouble?

7. Very much
6. Quite a lot
5. A little
4. Not at all

8. How much trouble have you had because of your skin with other people calling you names, teasing, bullying, asking questions or avoiding you?

9. Very much
6. Quite a lot
5. A little
4. Not at all

10. How much has your sleep been affected by your skin problem?

Hospital No.: 
Name: 
Age: 
Address: 

Diagnosis: 
Date: 

CDLQI SCORE: 

Children's Dermatology Life Quality Index

Please check that you have answered EVERY question. Thank you.

Patient Oriented Eczema Measure (POEM) for AD

<table>
<thead>
<tr>
<th>Question</th>
<th>No Days</th>
<th>1-2 Days</th>
<th>3-4 Days</th>
<th>5-6 Days</th>
<th>Every Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Over the last week, on how many days has your/your child’s skin been itchy because of the eczema?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Over the last week, on how many nights has your/your child’s sleep been disturbed because of the eczema?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Over the last week, on how many days has your/your child’s skin been bleeding because of the eczema?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. Over the last week, on how many days has your/your child’s skin been weeping or oozing clear fluid because of the eczema?</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. Over the last week, on how many days has your/your child’s skin been cracked because of the eczema?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6. Over the last week, on how many days has your/your child’s skin been flaking off because of the eczema?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Over the last week, on how many days has your/your child’s skin felt dry or rough because of the eczema?</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Total Score (maximum 28) ________
Atopic Dermatitis: American Academy of Dermatology Guidelines

- For the general management of patients with AD, available disease severity measurement scales are not recommended for routine clinical practice, because they were not usually designed for this purpose.
Assessment of AD in clinical practice

- Many use mild, moderate, or severe based on a number of factors:
  - Body surface area
  - Flare free interval
  - Need for high potency topical steroids
  - Quality of life measures: Sleep disturbance, Itch intensity, school absence
  - Need for daily topical medication use
  - Need for systemic medications