Managing Atopic Dermatitis with Emollient Therapy

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Disclosure

• Paul Horowitz, MD, has acted as a consultant and temporary advisor to Johnson & Johnson Consumer Inc. and Abbott Nutrition and is a member of a speakers’ bureau for Abbott Nutrition.

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Skin Function

- Natural **protective barrier** from
  - physical injury
  - pathogenic microbes
  - chemical agents
  - UV radiation
  - extreme temperatures
- Helps to restrict fluid and water loss
- **Sensory perception**: temperature, pressure, touch and pain
- **Temperature regulation** of the body

<table>
<thead>
<tr>
<th>HEALTHY SKIN</th>
<th>SKIN PARAMETER</th>
<th>ADULT</th>
<th>INFANT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STRUCTURE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>Microrelief Lines</td>
<td>Less Dense</td>
<td>More Dense</td>
</tr>
<tr>
<td>Thickness</td>
<td>Stratum Corneum (SC)</td>
<td>Thicker ~10 µm</td>
<td>Thinner ~7 µm</td>
</tr>
<tr>
<td></td>
<td>Epidermis</td>
<td>Thicker</td>
<td>Thinner (~20% vs. Adult)</td>
</tr>
<tr>
<td><strong>COMPOSITION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Content</td>
<td>Stratum Corneum (SC)</td>
<td>Lower</td>
<td>Higher (older infants, drier at birth)</td>
</tr>
<tr>
<td>NMF</td>
<td>Natural Moisturizing Factor Concentration</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Surface Lipids</td>
<td>Sebum</td>
<td>Higher</td>
<td>Lower (7-10 mo old)</td>
</tr>
<tr>
<td><strong>FUNCTION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEWL</td>
<td>Trans-epidermal water loss</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>pH</td>
<td>Surface pH</td>
<td>Lower</td>
<td>More Alkaline (newborn)</td>
</tr>
</tbody>
</table>

Skin Lipids Play an Important Role in Maintaining Skin Barrier Integrity for Healthy Skin

Stratum Corneum Lipid Content by Weight

- Free Fatty Acids: 12%
- Cholesterol: 59%
- Ceramides: 29%
Defective Skin Barrier in AD

Barrier Dysfunction Leads to Symptoms

• Dry Skin (xerosis)
• Itching (pruritis)
• Inflammation and redness (erythema)
• Scaling
• Elevated serum IgE
• With a chronic or chronic relapsing course
  • Symptoms come and go with exacerbation (flares)
Atopic Dermatitis (AD) Epidemiology

- Chronic, immune mediated, relapsing skin condition
- ~6% of the global population is affected
- 44.9 million in 2011\(^1\) (2016 predicted to be 46 million)
- Epidemiological studies suggest prevalence increasing \(^2\)
- 2005 – 1 in 74 people in England was newly diagnosed \(^3\)
- Atopic Dermatitis is one of the most common chronic relapsing childhood dermatoses \(^4,5\)

Atopic Dermatitis – Challenging to Treat

- **Short Term Objectives**
  - Control of flares, immediate reduction of itch, heal skin

- **Long Term Objectives**
  - Reduce severity & frequency of flares

- **Systemic medication often off-label in children**

- **Rx therapies associated with AEs and morbidity**

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### Treatment Steps Adapted to Disease Severity in AD

<table>
<thead>
<tr>
<th>Severity of AD</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry skin only</td>
<td>Skin hydration, moisturizer</td>
<td>Low-mid potency TCS and/or TCI</td>
<td>Mid-high potency TCS and/or TCI</td>
<td>Systemic therapy (CyA) or UV</td>
</tr>
<tr>
<td>Mild-moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate-severe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recalcitrant, severe</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

CyA, Cyclosporin A.  TCS, topical corticosteroid.  TCI, topical Immunomodulator

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Akdis et al. *J Allergy Clin Immunol* 2006;118:152–69
Emollient Use May Reduce Risk of AD in Infants

• Daily full-body use of an emollient (oil, cream/gel, ointment) from birth daily prevented atopic dermatitis in 124 neonates at high risk of AD

• Daily application of an emulsion moisturizer during first 32 weeks of life reduced risk of AD in 56 patients at high risk

• Regular oil baths in 118 infants reduced xerosis and could possibly reduce AD

Attributes of Oat in Skin Care

- **barrier function**
  - lipids & fatty acids
- **antioxidants**
  - enzymes
- **barrier replenishment**
  - polysaccharides
- **help maintain barrier integrity**
  - proteins
- **antioxidant**
  - vitamin E
- **cleansing**
Composition of Oat Lipids

• Total lipid content of oats – from 2% - 11.8% (dry weight)
• Triglycerides
• Phospholipids
• Lecithin
• Glycolipids
• Free fatty acids (oleic, linoleic, palmitic, stearic)

Buffering Capacity of Colloidal Oatmeal Restores pH of Damaged Skin to Normal Range

Skin pH Before Treatment

Skin pH After Treatment With Colloidal Oatmeal

Normal pH Range 4.2 – 5.5
UV Induced Redness Reduction
Avenanthramides vs. Other Fractions

Avenanthramides Inhibit Topical Irritation

IL-8 Release (pg/mL)
from Keratinocytes

Unstimulated  Stimulated

IL-8, Interleukin-8

Wallo W, et al. Poster presented at: 65th annual meeting of the AAD. February 2-6, 2007; Washington, DC.
Effectiveness of Colloidal Oat Lotion vs. Vehicle Lotion for Relief of Dry Itchy Skin

A Randomized, Double-Blind Bilateral Controlled Study to Evaluate the Effectiveness of an Oatmeal Containing Lotion vs Vehicle for the Relief of Dry, Itchy Skin, Johnson & Johnson Consumer Inc. data on file.
Colloidal Oatmeal Bath* Treatment of Dry and Sensitive Skin in Atopic Dermatitis

- *Colloidal oatmeal with ceramides and dexamethasone.
Daily Oat-based Skin Care Regimen for Atopic Skin: EASI Composite Score – Ages 12-60 Years

EASI (Mean)

Baseline | Week 2 | Week 4 | Week 8
--- | --- | --- | ---
6 | 4* | 2* | *

* Significant Improvement ($P<0.001$)

EASI, Eczema Area and Severity Index

Overall Improvements in QOL After 4 Weeks Using Colloidal Oatmeal Regimen

Dermatology Life Quality Index Children 2 Months to 6 Years

N=23

Baseline: 6.79

After 4 weeks: 4.52*

Data Support Safety of Topical Oat Products

- Post-marketing surveillance – No allergies reported by consumers of 455,820 products (N=2291) sold during a 3 year period

- Sensitization to cereals did not increase the risk of allergic reactions to oat-containing cosmetics in cereal sensitized atopic adults (N=12)

- No evidence of sensitization to topical colloidal oat in normal and atopic children (N=65)

- Extremely low incidence of adverse or allergic reactions from the use of oat-based products either in subjects with healthy skin or in those with an existing atopic dermatitis

- No oat sensitivity reported with topical oat in 173 infants under 12 months old treated for inflammatory lesions by moderate and or high potency topical corticosteroids randomly assigned to receive emollient or not (control group)

Key Messages

- Skin performs critical functions
- Infant skin is still developing (SC thinner, NMF & Lipids lower, TEWL is higher)
- Maintaining skin barrier integrity essential; skin lipids and pH play important roles
- Skin barrier is defective in AD patients; barrier dysfunction leads to symptoms (dryness, itching, inflammation, poor QOL, chronic / chronic relapsing course)
- AD Challenging to Treat
  - Emollient use may reduce risk of AD in infants (but not all emollients are the same)
Key Messages

• Many eczema flare-ups can be prevented with CONSISTENT emollient use to maintain skin barrier function

• Oat has attributes in skincare that can benefit AD
  • Barrier function (lipids), pH buffering capacity, reduce inflammation (avenanthramides), ceramide formation (lipids)

• Skincare products containing oats:
  • Generally recognized as safe (USFDA), sensitization uncommon
  • Powerful, time-tested tools in managing AD and can improve patient QOL
Thank You!