Approach to Diaper Rashes

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Disclosure
• I have no relevant financial relationships with the manufacturers of any commercial products discussed in this CME activity
• I do not intend to discuss an unapproved use of a commercial product in my presentation

Learning Objectives
• Discuss differential diagnosis of diaper rashes in infants
• Review clinical features of common diaper rashes in infants
• Discuss treatments for the common diaper rashes in infants
Diaper Dermatitis

- Affects 50-65% of neonates and infants
- Peaks at 12 months of age

Blume-Peytavi et al. *Pediatric Dermatology*. 2018;35:s19-s23

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Differential diagnoses of Diaper Dermatitis

- **Inflammatory**
  - contact dermatitis, psoriasis, seborrheic dermatitis, atopic dermatitis
- **Infectious/Infestations**
  - candida, strep/staph, scabies
- **Metabolic**
- **Autoimmune**
- **Neoplasm**

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Differential diagnoses of Diaper Dermatitis

- **Inflammatory**: contact dermatitis, psoriasis, seborrheic dermatitis, atopic dermatitis
- **Infectious/Infestations**: candida, strep/staph, scabies
- **Metabolic**: acrodermatitis enteropathica, nutritional deficiency
- **Autoimmune**: lichen sclerosus
- **Neoplasia**: Langerhans cell histiocytosis
Clinical subgroups of diaper rashes

I. Dermatitis due to the diaper
   - Irritant diaper dermatitis
   - Allergic contact dermatitis

II. Dermatitis worsened by the diaper

III. Eruptions in the diaper area independent of the diaper

Case

6 months old healthy baby girl with erythematous patches sparing the folds in the diaper area
Irritant diaper dermatitis

• Most common cause of diaper rashes
• Prolonged contact with urine/feces
• Pattern: Convex surfaces, spares the inguinal creases/gluteal cleft

Causative factors/Prevention

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged &amp; excessive humidity</td>
<td>Friction</td>
<td>Frequent diaper change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supra-absorbent diaper</td>
</tr>
<tr>
<td>Alkaline urine</td>
<td>Disrupts pH balance</td>
<td>Clean with wipes or water</td>
</tr>
<tr>
<td>Feces</td>
<td>Microbial overgrowth</td>
<td>Topical emollient</td>
</tr>
<tr>
<td></td>
<td>Activation of fecal lipases, proteases</td>
<td>EDUCATION</td>
</tr>
<tr>
<td>Harsh soaps and wipes</td>
<td>Skin barrier break down</td>
<td>Topical emollient</td>
</tr>
<tr>
<td></td>
<td>Skin maceration</td>
<td>EDUCATION</td>
</tr>
<tr>
<td></td>
<td>Increased permeability</td>
<td></td>
</tr>
</tbody>
</table>

Barrier creams

• Zinc oxide
  • Regular strength 13-16%
  • Maximum strength 40%
Barrier creams

• Petrolatum
• Beeswax
• Dimethicone

pH balance

• Vinegar: Dilution 1:10 parts water

• Maalox: can be mixed with other barrier creams to make “Butt paste”

Cholestyramine ointment

• Bile acid in the stool is an irritant

• Cholestyramine is a bile acid sequestrant

• Compound cream, apply twice a day
**Treatment**

- Mild topical steroid + Anti-yeast
- Hydrocortisone 2.5\% cream mixed with
  - Nystatin, miconazole, ketoconazole cream

Apply to AA twice a day

**Case**

CC: Diaper rash

4 week old baby boy with persistent ulcers and rash to his diaper area and perineum.

Previous Treatments:
- Desitin, Nystatin cream, cholestyramine cream

**Jacquet Erosive Diaper Dermatitis**

- Associated with frequent stooling, infrequent diaper changes and poor quality diapers
- PE = well-demarcated erosions and superficial erosions @ perianal skin, opposing areas of buttocks
**Case**

- 5 week old boy w/ 2 – 3 week history of worsening diaper rash.
  - No pre-/peri-natal infections

- FHx: no known FH of skin dz, no social contacts w/ similar lesions

- SocHx: only child

**DDx**

- Herpes simplex (HSV)
- Candidiasis
- Bacterial infections
- Genital warts
- Irritant diaper dermatitis

**Perianal Pseudoverrucous Papules**

**Reactionary pattern**

following chronic, persistent irritation due to feces and/or urine

PE = dome-shaped papules w/ shiny, smooth, white or red surface
Case

- 6 months old healthy baby girl with erythematous patches and excoriated erosions and vesicles on the buttocks

Read the labels carefully....

- Ingredients - Calendula officinalis 1X HPUS-10% - Inactive
  Ingredients: Alcohol, caprylyl glycol, carbomer, cetyl ate, EDTA disodium, glycerin, lauroyl macrogolglycerides, pegoxol-7 stearate, purified water, sodium hydroxide, sorbic acid, 1, 2-hexanediol

Allergic contact diaper dermatitis

- Type IV hypersensitivity reaction

- Pattern: whole diaper area and buttocks

- Treatment: patch testing, avoid offending agents, topical steroid

- Folster-Holst R. Pediatric Dermatology. 2018:35:10-18
Allergic contact dermatitis

I. Diaper wipes/diaper creams

1) Botanical extracts
2) Fragrance
3) Preservatives
4) Emulsifiers
5) Emollients

II. Diaper components

1) Polypropylene, polyethylene, polyurethane → plastic polymers
2) Mercaptobenzothiazole, thiuram → Rubber accelerators
3) Disperse dye
4) Fragrance mix
Clinical subgroups of diaper rashes

- II. Dermatitis worsened by the diaper
  - Fungus: Candida albicans
  - Bacteria: Staph aureus or Strep. E. Coll
  - Virus: HSV, VZV
  - Psoriasis
  - Seborrheic dermatitis

• Coughlin C et al. Pediatric Dermatology. 2014:31 19-24

Candidal diaper dermatitis

- Beefy red patches with satellite macules or pustules
  - Treatment: topical nystatin, azole antifungal, oral fluconazole
Case
• 2 y/o with persistent itchy rash (x > 10 days) despite avoidance of potential irritants and regular application of nystatin.

Perianal Strep
• Beta-hemolytic streptococcus
• Bright red perianal patches

Management
Strep:
• Bacterial culture
• 10-day course amoxicillin
• Topical mupirocin ointment

Staph:
• Bacterial culture
• 10-day course cephalixin, clindamycin, oxacillin
• Topical mupirocin ointment
Case
2 m/o with 2 – 3 week history of worsening eczema; no improvement on HC 1% or TAC 0.1% creams

• PMH: Healthy w/ no concerning prenatal/delivery dx

Scabies
• Lifespan: 15-30 days
• Females lay 1-4 eggs A DAY!
• Eggs hatch in 3-4 days
• Takes 15-20 min of contact on average and 3 weeks for symptoms to surface

Affected areas
Treatment Options

<table>
<thead>
<tr>
<th>Name</th>
<th>Indications for Use</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permethrin 5%</td>
<td>Apply from neck down, once in 24 hours</td>
<td>Not for use under 2 months of age, may repeat in 1 week if necessary; head lice in infants</td>
</tr>
<tr>
<td>Loxeal 1%</td>
<td>Apply from neck down, once in 24 hours</td>
<td>Not recommended for infants; not fast-line therapy; potential DNA toxicity</td>
</tr>
<tr>
<td>Scalp 5% lotion</td>
<td>Apply from neck down, once in 24 hours</td>
<td>Elderly therapy; malabsorption, compromised in pediatrics; safe in infants, pregnant women</td>
</tr>
<tr>
<td>Sulfa 5%</td>
<td>Apply from neck down for 3 consecutive nights; once in 24 hours after last application</td>
<td>Safe in infants, pregnant women</td>
</tr>
<tr>
<td>Ketoconazole cream (Taro)</td>
<td>Apply from neck down for 3 consecutive nights; once in 48 hours after last application</td>
<td>Safe in infants, may wash off for applications</td>
</tr>
<tr>
<td>Daktarin cream</td>
<td>Apply nightly or every other night for 5 applications</td>
<td>Not available in the United States</td>
</tr>
<tr>
<td>Terbinafine (ketoconazole)</td>
<td>3 doses, 2 weeks apart</td>
<td>Safe in infants, pregnant women</td>
</tr>
</tbody>
</table>

Treatment plan

- For infants: include scalp & face
- For children/adults: neck down
  - 1 application leave on for 8-12 hours then wash off
  - Repeat in 1 week
  - Wash clothes and linens in hot water and dried high-heat setting.
  - Stuffed animals should be stored in bags for 3-7 days

Case

- 5 m/o boy with worsening diaper rash
  - Not improved with Desitin, nystatin, topical tetracycline and aquaphor/cholestyramine
- ROS: negative – no preceding diarrhea, patient gaining weight well, developmentally appropriate
- PMH/FHx/SocHx: negative, non-contributory
Psoriasis

**Pattern:** Scalp, buttocks, periumbilical area

**Treatment:**
Mild topical steroid cream, calcipotriene cream, tacrolimus/pimecrolimus cream

Seborrheic Dermatitis

- Resolve by age 6-9 months
- **Treatment:** Mild topical steroid

Clinical subgroups of diaper rashes

- III. Eruptions in the diaper area independent of the diaper
  - Acrodermatitis enteropathica
  - Langerhans Cell Histiocytosis
  - Hemangioma
  - Lichen sclerosus

Figure 14.27: Seborrheic Dermatitis. Pediatric Dermatology. 4th ed. By Lawrence A. Schachner, MD and Ronald C. Hansen, MD.
Case
• CC: worsening eczema

• HPI: 4 m/o boy with ~2 month h/o rash around the mouth, scalp and diaper area
  - Patient is formula fed

• ROS: frequent, loose, watery stools, following growth curve

• PMH: no known medical conditions

Acrodermatitis Enteropathica

Lab testing
- Zinc levels
- Alkaline phosphatase
- SLC39A4, zinc transporter protein

Treatment:
Oral zinc gluconate or sulfate 1-3mg/kg/day
IV 300-1000mcg/kg/day

Langerhans Cell Histiocytosis

Crusted papules and petechiae are also noted at the scalp and axillae.
Hemangioma

Case
2 y/o girl with diaper rash. Potty trained. No complaints of pain with urination.

Lichen sclerosus
• White glistening, atrophic vulvar area

• Treatment: high potency topical steroid (clobetasol, halobetasol ointment), tacrolimus ointment
References