Baby Rashes – Skin Eruptions in Newborns and Infants: Common Place and the Concerning

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Disclosures

My spouse/partner and I have the following relevant financial relationship with a commercial interest to disclose:

Gritstone Oncology (salary, stock)

Path AI (stock)

UpToDate (royalty)

Purity Brands (consultant)

CASE 1: PUSTULES

Neonatal Pustules

Micro Workup

- Pustule gram stain: few polys, no organisms
- Pustule culture: no growth
- Blood cultures: no growth

Pustules in Infancy

- Erythema toxicum neonatorum
- Transient neonatal pustular melanosis
- Neonatal acne
- Acropustulosis of infancy
- Congenital cutaneous candidiasis
- Eosinophilic pustular dermatosis of infancy

Erythema Toxicum Neonatorum

- Most common pustular disease in **full term** infants with vesicles/pustules in **first few days of life**
- Often resolve within 24 hours but can last for up to 2 weeks. No longterm sequelae.
- **Eosinophils** surround pilosebaceous apparatus below basement membrane
- 7% with eosinophilia

Transient Neonatal Pustular Melanosis

- **African-American** infants
- 0.2-4% of newborns
- Present at birth and **resolves within 24-48 hours**
- Small clustered pustules/vesicles that rupture easily leaving collarettes of scale and hyperpigmented macules. Minimal erythema
- **Neutrophils** >> eosinophils

Neonatal Acne (Neonatal Cephalic Pustulosis)

- 20% of newborns
- First few **weeks** of life
- Localized to **face** typically
- Associated with malassezia
- May see **sebaceous hyperplasia**

Acropustulosis of Infancy

- Onset at birth to 2 years of age
- **African Americans, males**
- Worse in summer
- **Recurrent** crops of pruritic acral subcorneal pustules that **increase in size** over a week and resolve in 2-3 weeks
- **Neutrophils**

Congenital Cutaneous Candidiasis

- **At birth or first 12 hours** of life
- Erythematous macules and papulopustules on face, trunk, extremities
- **Most do not have systemic disease** although low birthweight infants are at greater risk
- **Topical antifungals**

Eosinophilic Pustular Dermatosis of Infancy

- Described by Ofuji/Lucky
- Not associated with HIV
- **Male**:Female = 4:1
- **Onset first 14 months, resolves by 3 years of age**
- **Recurrent** crops every 1-3 weeks of sterile, pruritic (follicular) papules and pustules on face, **scalp**
- **Topical steroids**

Pustules in Infancy

- **Erythema toxicum neonatorum**
  - First days, FT, Eosinophils
- **Transient neonatal pustular melanosis**
  - At birth, AA, Neutrophils
- **Neonatal acne**
  - First weeks, face, malassezia
- **Acropustulosis of infancy**
  - Recurrent, AA, Neutrophils
- **Congenital cutaneous candidiasis**
  - At birth/first hours, may not have systemic symptoms
- **Eosinophilic pustular dermatosis of infancy**
  - By 14 months, recurrent, topical steroids

Reference: Mengesha and Bennett Am J Clin Dermatol 2002

CASE 2: VESICLES & PAPULES

Differential Diagnosis

- Acrodermatitis Enteropathica (Zn deficiency)
- Acropustulosis of Infancy
- Eosinophilic pustular folliculitis
- Erythema toxicum neonatorum
- Incontinentia pigmenti
- Mastocytosis
- Seborrheic dermatitis
- TORCH infections - **Toxoplasmosis, Other (syphilis, varicella-zoster, parvovirus B19), Rubella, Cytomegalovirus (CMV), and Herpes infections**
- Wiskott-Aldrich Syndrome
- Congenital Varicella
- Neonatal HSV
- Seborrheic dermatitis
- Psoriasis
- Scabies
- Atopic Dermatitis
- Folliculitis
- Hyperimmunoglobulinemia E Syndrome
- Langerhans cell Histiocytosis
  - Multifocal
  - Unifocal
  - Congenital Self-Healing

“Blueberry Muffin”

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Blood cultures, HSV/VZV DFA & cultures, empiric antibiotics and acylovir!

Langerhans Cell Histiocytosis: Initial Workup

- **Blood:**
  - CBC+diff, retics, ESR, direct/indirect Coombs, Ig levels, coags, LFTs
  - BM aspirate
- Urinalysis (DI)
- Imaging:
  - **CXR** – micronodular/interstitial infiltrate, spared costophrenic angles, late honeycombing
  - High-res CT if suspected
  - **Skeletal survey** – differentiate unifocal vs. multifocal
  - CT/MRI/FDG-PET (LNs, spleen, lung)
    - FDG-PET – identify late relapsers

Late Effects

- Endocrinopathies
- Cognitive deficits
- Neurologic problems
- Orthopedic defects
- Poor lung function
- Liver disease
- Dental problems
- Elevated malignancy risk

CASE 3: MEMBRANE OR BLISTERS

Newborn with a “Membrane”

Collodian baby

“Collodian Baby”

- 65% autosomal recessive congenital ichthyosis
- 5-6% shed collodian membranes -> normal skin

- Early Management: emollients, hydration, warmth, eye/mouth care

Lamellar Icthyosis

- Autosomal recessive congenital icthyosis
- Mutation in transglutaminase 1 (*TGM1*) – formation of cornified envelope.

- Range of clinical features (mild to severe)
  - large lamellar plate-like scales with relatively mild underlying erythroderma
  - +/- Ectropion and mild eclabium
  - Scales prominent over the face, trunk, and extremities – flexor areas
  - Palms and soles: palmar hyperlinearity vs. keratoderma with fissures
  - Scalp: scarring partial hair loss
  - Nails: stippled, pitted, ridged, or thickened, subungual hyperkeratosis

Blisters in Newborn/Infant

- Epidermolysis Bullosa
- Ichthyoses
- Incontinentia Pigmenti
- Immunobullous – EBA, LIGA, BP, CP, pemphigus
- Infectious – HSV, bullous impetigo, SSSS, syphilis, etc.
- Bullous mastocytosis
- Traumatic blisters

CASE 4: ERUPTIONS WITH SCALE

Differential Diagnosis of Atopic Dermatitis: Serious/Rare Conditions

- Metabolic/nutritional/genetic
  - Acrodermatitis enteropathica / zinc deficiency
  - Other nutritional deficiencies (biotin, essential FA)
  - Netherton syndrome
  - Phenylketonuria
  - Gluten-sensitive enteropathy
  - Hurler syndrome
- Immune disorders
  - Hyper IgE syndrome
  - SCID
  - Wiskott-Aldrich
  - Agammaglobulinemia
  - Ataxia-telangiectasia
  - Neonatal lupus erythematosus
- Proliferative disorders
  - Langerhans cell histiocytosis

From Box 15-3 Neonatal Dermatology, ed. Eichenfeld, Frieden & Esterly

Empiric Treatment

- Afebrile, eating, stooling, activity @ baseline

Home care:

- Dilute bleach baths daily
  - National Eczema Association “recipe”
- Topical corticosteroids BID
- Emollient QID
- Wet wraps
- 1 week follow up; call patient in 3 days

Infectious Complications of Eczema

Deficiency in cutaneous antimicrobial peptides

Impaired regulatory T cell function

- Bacterial infections
  - *S. aureus/MRSA*
- Viral infections
  - HSV (eczema herpeticum)
  - Warts
  - Molluscum
  - Coxsackie

CASE 5: MIMIC

Neonatal Lupus

- 1-2% of babies born to mothers with autoimmune disease (systemic lupus, Sjogren's syndrome and antibodies to SSA/Ro or SSB/La)
- Mothers may not have symptoms at the time of infant's birth

- Transplacental passage of maternal anti-SSA/Ro or anti-SSB/La antibodies
- Recurrence rate of NL after initial child born 35-50%

Treatment/Course

- Cardiology referral
  - Normal ECHO and EKG
- Topical steroids to rash
- Follow-up at age 4 months showed improving eruption

Dermatologic Findings

- Present at birth or up to 4 months of life (mean 6 weeks)
- Annular, arcuate, with central atrophy rarely urticarial
- Scalp and face: raccoon eyes
- Photosensitive
- May resemble a fungal infection
- Resolves in 6-8 months. Rare long term sequelae: telangiectases

Complications

- Heart Block: Binding of anti-SSA/Ro or anti-SSB/La antibodies to fetal cardiac tissue damaging AV node rarely SA node
    - Manifests between 18-24 weeks gestation
- Elevated liver function, hepatosplenomegaly, cholestasis, hepatitis 9-15%
- Anemia, neutropenia, thrombocytopenia
- Hydrocephalus, macrocephaly