Neonatal Dermatologic Potpourri

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Neonatal Dermatologic Potpourri

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- I do not intend to discuss off label use of a commercial product/device in my presentation.
Objectives

After participating in the presentation, you should have an increased knowledge and enhanced competence to

- Recognize several dermatoses seen in the neonate
- Develop a brief differential diagnosis for vesiculopustular lesions in the neonate
- Discuss differences in premature neonatal skin
Neonatal Skin Disorders

- Premature Neonatal Skin
  - Neonatal Skin Infections
  - Anetoderma of Prematurity
- Developmental Defects
- Vesiculopustular lesions
- Diaper Dermatitis
Premature Neonatal Skin

- Increasingly improved survival of premature infants
- Stratum corneum (epidermal barrier) becomes functionally mature between 32 and 34 weeks gestation
- Stratum corneum of premature infants is less functionally effective than full term infants
  - Takes at least 2-4 weeks postnatal age to develop a more competent barrier (longer for extremely premature infants)
Premature Neonatal Skin

Premature neonates experience significant skin related morbidity due to:

- Insensible water loss
  - Fluid and electrolyte imbalance
  - Increased heat loss
- Physical and mechanical skin injury from multiple procedures
- Percutaneous absorption of topical agents
- Sepsis secondary to skin fragility and breakdown
Opportunistic Fungal Infections

- Premature neonates are at an increased risk of opportunistic fungal infections
  - Immature immune function
  - Prolonged broad spectrum antibiotic exposure
  - Skin trauma/damage with disrupted epidermal barrier

- Cutaneous infections can lead to invasive infection with high morbidity & mortality
  - Aspergillosis, Candidiasis, Zygomycetes (Rhizopus & Mucor)
Opportunistic Cutaneous Fungal Infections

- Skin lesions in premature neonates can present with
  - Erythematous papules, pustules, or plaques
  - Erosions & ulcers with hemorrhagic eschar or crust
  - May also have signs of clinical instability

- Emergent biopsy for histology & culture
  - Aids in diagnosis & treatment options
  - Workup for possible systemic infection
Congenital Cutaneous Candidiasis

- Rare congenital skin infection presenting at birth or within the first 6 days of life
- Characteristic skin patterns
  - Papulopustular eruption (morbilliform appearing eruption)
  - Burn-like dermatitis or extensive erosions
    - More common in premature neonates
Congenital Cutaneous Candidiasis

- Affected premature infants have increased morbidity and mortality due to systemic involvement and require comprehensive workup
  - Recommend Infectious Diseases involvement
- Premature infants usually require systemic antifungal therapy
Anetoderma of Prematurity

- Atrophic patches & outpouchings of skin
- Not associated with prior trauma
  - ?Relationship to monitoring leads/tape
- Common locations
  - Trunk and proximal extremities
- Lesions appear within 2-3 months of life in extremely premature infants (24-29 weeks gestation)
- Over years lesions evolve into anetoderma
- Histology: loss of dermal elastic tissue
Developmental Defects

- Cranial Dysraphism
- Aplasia cutis congenita
- Spinal Dysraphism
Cutaneous Signs of Cranial Dysraphism

- Up to 1/3 of congenital non-traumatic scalp nodules may connect to the underlying central nervous system.

- Cephaloceles - the term refers to a congenital herniation of intracranial structures through a skull defect.
  - Includes meningoceles and encephaloceles.
Smaller & atretic cephaloceles may be mistaken for a variety of cutaneous lesions including:

- Infantile hemangiomas, hematomas, aplasia cutis, dermoid or epidermal cysts

Cephaloceles can occur in frontal, parietal, or occipital scalp

- Recent study showed majority of cases were on the vertex
- Usually midline or slightly lateral to midline
Hair Collar Sign

- Evaluation of an infant with a congenital scalp nodule surrounded by a hair collar should include a complete physical exam, neurologic exam, & MRI (specifically focusing on scalp lesion)
  - The presence of a co-existent vascular stain may increase the suspicion of associated cranial dysraphism (intracranial connection to the mass)
  - Neurosurgical referral suggested when evidence of intracranial communication on imaging
Aplasia Cutis Congenita

- Congenital absence of skin
  - Most common on scalp
- Solitary or multiple lesions
- Can present with an ulcer and granulation tissue or a superficial erosion
  - Recommend wound care to area
  - Eventually heals into scar tissue with associated alopecia
Aplasia Cutis Congenita

- May be secondary to incomplete closure of the neural tube
  - Membranous aplasia cutis
    - Translucent membrane with associated hair collar sign
- Multiple possible rare associated anomalies
- Majority of patients with localized lesions have a good prognosis
Markers of Spinal Dysraphism (Spinal Cord Abnormalities)

- Midline lumbosacral hemangiomas
- Aplasia cutis congenita
- Midline lipomas
- Midline skin tags
- Hypertrichosis of midline spine
- Deep and large sacral dimple (isolated simple dimples do not require w/u)
  - Dimples >2.5 cm from the anal verge
- Asymmetrically deviated gluteal cleft
- Midline congenital melanocytic nevi (low risk)
- 2 or more findings increases risk of spinal dysraphism
Spinal Dysraphism Work-up

- Radiologic imaging provides a sensitive screening modality
  - Imaging should be performed *prior* to surgical intervention
- MRI is the diagnostic gold standard
  - High resolution ultrasound may be a screening alternative in infants less than 4 months of age (prior to skeletal maturation)
  - High risk cutaneous markers are best evaluated still by MRI
## Vesicular & Pustular Lesions in Neonates: Differential Diagnoses

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<th>Non-infectious</th>
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<tr>
<td>▪ Erythema toxicum</td>
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<tr>
<td>▪ Pustular melanosis</td>
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<tr>
<td>▪ Miliaria</td>
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<tr>
<td>▪ Neonatal acne</td>
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<td>▪ Bullous mastocytosis</td>
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<tr>
<td>▪ Incontinentia pigmenti</td>
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<td>▪ Epidermolysis bullosa</td>
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<td>▪ Langerhans cell histiocytosis</td>
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<td>▪ Pustular leukemoid reaction</td>
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<table>
<thead>
<tr>
<th>Infectious</th>
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<tr>
<td>▪ Herpes simplex</td>
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<tr>
<td>▪ Impetigo- <em>Staph aureus</em></td>
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<td>▪ Candidiasis</td>
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<td>▪ Scabies</td>
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<td>▪ Group B streptococcus</td>
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<td>▪ Pseudomonas</td>
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<td>▪ Syphilis</td>
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<td>▪ Aspergillus</td>
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Distinguishing Non-infectious From Infectious Neonatal Eruptions

- Smears of skin lesions
  - Gram stain
  - KOH
  - Wright stain
- Cultures from skin lesions
  - Bacterial
  - Viral
  - Fungal
- Skin biopsy
Transient Benign Lesions

- Erythema Toxicum
- Transient Neonatal Pustular Melanosis
Erythema Toxicum

- Self-limited, asymptomatic condition
- Begins during the first few days of life
- Most common eruption in the term neonate
- Blotchy red macules and patches with overlying papule or pustule
  - More commonly on the trunk, buttocks, and proximal limbs
- Lesions wax and wane, resolve within 1 week
- Wright stain shows numerous eosinophils
Transient Neonatal Pustular Melanosis

- Unknown etiology
- Pustular skin eruption
- More common in darker pigmented neonates
- 3 stages
  - 1\textsuperscript{st} superficial pustules present at or near birth
  - 2\textsuperscript{nd} superficial erosions with collarette of scale
  - 3\textsuperscript{rd} hyperpigmented macules, may last months
- Gram stain: neutrophils, no organism
Neonatal Skin Infections

- Impetigo neonatorum
- Neonatal herpes simplex virus (HSV)
Impetigo Neonatorum

- Multiple pustules most common in the diaper region and lower abdomen in neonates
- Gram stain: gram positive cocci in clusters
- Bacterial culture: *Staphylococcus aureus*
- Usually requires systemic antibiotic
Neonatal Herpes Simplex

- Infection with Herpes Simplex virus
  - 1/3200 deliveries
- Retrospective study found a similar prevalence as bacterial meningitis in neonates admitted from a large ER (0.2%)
- Neonates whose mothers develop a primary genital HSV infection late in pregnancy are at highest risk
  - Majority of neonates acquire infection during delivery
Neonatal Herpes Simplex

- 3 categories of neonatal HSV
  - Skin, eye, mucous membrane (SEM) involvement (45%)
  - Central nervous system involvement (30%)
  - Disseminated infection (lungs, liver, CNS, SEM, adrenal) (25%)

- Affected neonates usually present between 5-21 days of life
  - Skin, eye, mucous membrane involvement presents most commonly at 10-12 days of age
Neonatal Herpes Simplex

- Factors associated with neonatal HSV
  - Maternal primary HSV infection, vaginal delivery, prematurity, postnatal HSV contact, seizures, vesicular rash, hypothermia, lethargy, CSF pleocytosis, hepatosplenomegaly, elevated hepatic enzymes, maternal fever, respiratory distress, and thrombocytopenia

- If skin lesions are present
  - Grouped 2-4 mm vesicles on an erythematous base which evolve into pustules and crusted erosions (common on scalp)
Neonatal Herpes Simplex

- High associated morbidity and mortality if not diagnosed/treated early
- Recommended work-up of suspicious skin lesions
  - Viral culture of base of vesicle/lesion
  - Consider HSV PCR of base of vesicle/lesion
- Thorough systemic workup
  - Lumbar puncture for HSV PCR & viral culture
  - Surface swabs sent for viral culture of mouth, conjunctiva, nasopharynx, & rectum
  - Rule out disseminated infection
- Systemic acyclovir at high doses
  - Infectious Diseases consultation
Diaper Dermatitis

- Variants of diaper dermatitis
  - Common
    - Irritant contact diaper dermatitis
    - Infectious-candida, staph, strep
    - Seborrheic dermatitis
    - Allergic contact dermatitis
  - Uncommon
    - Psoriasis
    - Zinc deficiency
    - Langerhans Cell Histiocytosis
Irritant Contact Diaper Dermatitis

- Affects up to 25% of infants wearing diapers
- Due to increased skin hydration, exposure to chemical irritants, & friction beneath the diaper
  - Chronic stooling can exacerbate
- Erythema involving the convex surfaces of the buttocks, perineum, lower abdomen, & thighs
  - Commonly spares the skin folds
- Severe cases may have superficial erosions
Treatment of Irritant Contact Diaper Dermatitis

- Frequent diaper changes
  - ?Super absorbent diapers
- Gentle cleansing
- Possible avoidance of diaper wipes
- Topical barriers ointments/cream
  - Zinc oxide
  - White petrolatum
Treatment of Infectious Diaper Dermatitis

- Candidal diaper dermatitis
  - Antifungal cream (effective for yeast) or ointment
    - Azoles (clotrimazole, miconazole, ketoconazole)
- Impetigo
  - Topical or oral antibiotics
- Perianal Strep or Strep Intertrigo
  - Oral antibiotic
- All types benefit from topical barriers
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References


References


Drolet BA et al. When good is not good enough: the predictive value of cutaneous lesions of the lumbosacral region for occult spinal dysraphism. *Arch Dermatol* 2004;140(9):1153-1155.


