Newborn Skin Disease: Rashes

Basic Dermatology Curriculum

Content for this module was developed by the Society for Pediatric Dermatology
Goals and Objectives

- The purpose of this module is to help learners develop a clinical approach for rashes in newborns.
- By completing this module, the learner will be able to:
  - Identify the morphology, distribution, and characteristic timing of erythema toxicum, transient neonatal pustular melanosis, miliaria, seborrheic dermatitis and neonatal cephalic pustulosis (neonatal acne).
  - Distinguish these benign neonatal rashes from conditions that require diagnostic and therapeutic interventions (such as skin infections and inherited conditions).
  - Identify and perform initial work-up and management for a patient with neonatal HSV.
  - Identify clinical findings that can suggest neonatal Langerhans cell histiocytosis and discuss approach to managing these patients.
Newborn rashes discussed in this module:

- Erythema toxicum neonatorum
- Neonatal cephalic pustulosis (Neonatal acne)
- Transient neonatal pustular melanosis
- Miliaria
- Seborrheic dermatitis
- Neonatal herpes simplex virus
- Neonatal Langerhans cell histiocytosis
Case One

Gordon
ID: 3-day-old male
HPI: 24 hour history of small white to yellow papules and pustules surrounded by erythematous (blotchy), inflamed skin. Lesions seen on his face, trunk, and extremities.
PMH: Full-term, vaginal birth with no complications.
FHx: Mother is a healthy 30-year-old, no history of medications during or after pregnancy.
Case One: Skin Findings

[Images of skin lesions]
Case One: Question 1

Based on Gordon’s history and this image of Gordon’s rash, what is the most likely diagnosis?

A. Congenital candidiasis  
B. Erythema toxicum neonatorum  
C. Herpes simplex  
D. Nonspecific viral exanthem  
E. Staphylococcal impetigo
Case One: Question 1

Answer: B

Based on Gordon’s history and this image of Gordon’s rash, what is the most likely diagnosis?

A. Congenital candidiasis (can present with pustules, erosions or beefy erythematous appearance, generalized scaling, can test with KOH)

B. Erythema Toxicum Neonatorum

C. Herpes simplex (presents with clusters of vesicles and crusting)

D. Nonspecific viral exanthem (highly unlikely in newborn, usually associated with prodromal symptoms)

E. Staphylococcal impetigo (flaccid vesicles/bullae, pustules and yellowish crusting)
Differential Diagnosis

Note the scaling in this example of congenital candidiasis

Clusters of vesicles seen in neonatal herpes infection
Differential Diagnosis

Flaccid blisters in a newborn with bullous impetigo secondary to Staph

Well developed pustules in staphylococcal impetigo
Erythema Toxicum Neonatorum (ETN): Clinical Presentation

Common condition of healthy and usually full-term infants.
- Less common in premature and low birth weight babies
- May be present at birth, but typically appears within 24 to 48 hours

Morphology
- Erythematous macules and papules that rapidly progress to flacid pustules on an erythematous base

Distribution
- Face, trunk, buttocks and proximal extremities
- Palms and soles are almost never affected

Aside from the rash, the infant is otherwise healthy
ETN: Diagnosis

The diagnosis of ETN is made clinically, based upon the history and morphology of the lesions. Testing is not necessary.

**Histology**
- ETN can be confirmed by a Wright-stained smear of a pustule that demonstrates numerous eosinophils

**Culture**
- If the presentation is atypical, cultures for bacteria, fungus, and virus should be obtained
- Cultures should all be negative in ETN
ETN: Prognosis and Treatment

Treatment
• No treatment is necessary

Prognosis
• The rash usually resolves in five to seven days
• It may wax and wane before complete resolution
• Recurrence are rarely seen
Case Two

Maria
ID: 18-day-old female

HPI: Maria presents with a 5 day history of several red lesions on both cheeks.

PMH: full-term, vaginal birth with no complications

FHx: Mother is a 26 year old with a history of migraines who took acetaminophen several times during her pregnancy.
Case Two: Skin Findings
Case Two: Question 1

From the following options, which best describes the cause of Maria’s rash:

A. Maria has a congenital viral infection that was transmitted for her mother during delivery
B. Maria’s mother took acetaminophen during the second and third trimester of pregnancy
C. Maria’s rash is most likely the result of an inflammatory reaction to Pityrosporum (Malassezia) species.
D. Maria’s lesions are result of an allergic reaction to the soap
E. Maria’s rash is the result of immaturity of some structures of her skin
Case Two: Question 1

Answer: C

From the following options, which best describes the cause of Maria’s rash:

A. Maria has a congenital viral infection that was transmitted for her mother during delivery
B. Maria’s mother took acetaminophen during the second and third trimester of pregnancy
C. Maria’s rash is most likely the result of an inflammatory reaction to Pityrosporum (Malassezia) species.
D. Maria’s lesions are result of an allergic reaction to the soap
E. Maria’s rash is the result of immaturity of some structures of her skin
Neonatal acne: Clinical Presentation

• Background
  – Self limited condition that occurs in up to 20% of newborns
  – Presents between the 2\textsuperscript{nd} and 3\textsuperscript{rd} week of life and resolves around 6-12 months of age
  – It is not true acne, but an inflammatory reaction possibly to \textit{Pityrosporum (Malassezia)} species.
  – The term \textit{neonatal cephalic pustulosis} has been proposed to replace the term neonatal acne

• Clinical Presentation
  – Inflammatory papules and pustules
  – Located mainly on the forehead, nose, and cheeks
  – There are no true comedones (black heads or white heads)
Case Two: Question 3

What would be your first treatment option for Maria?

A. Amoxicillin 35mg/kg/day for 7-10 days
B. Tazorotene 0.05% cream qhs for 3 months
C. 10% salicylic acid BID during 2 weeks
D. This is a self-limited condition and usually doesn’t require any treatment
E. Refer immediately to the endocrinologist to rule out precocious puberty
Case Two: Question 3

Answer: D

What would be your first treatment option for Maria?
A. Amoxicillin 35mg/kg/day for 7-10 days (this antibiotic has no indication in neonatal acne)
B. Tazarotene 0.05% cream for 3 months (topical retinoids are indicated in comedonal acne patients)
C. 10% salicylic acid BID during 2 weeks (salicylic acid in young children may result in severe skin irritation and there is risk of systemic absorption).
D. This is a self-limited condition and usually doesn’t require any treatment (some patients may benefit from topical antifungals)
E. Refer immediately to the endocrinologist to rule out precocious puberty (neonatal acne is a benign condition and is not associated with precious puberty)
Case Three

Daniel
Case Three: History

**ID:** 1-day-old male

**HPI:** Daniel presents at birth with a widespread rash involving face, trunk and extremities. His lesions consist of pustules and hyperpigmented macules with discrete scaling. No erythema is evident around the lesions. He is afebrile and otherwise healthy baby.

**PMH:** Full-term, c-section delivery due to breech.

**FHx:** Mother is a healthy 27 year old African-American woman with no history of medications during or after pregnancy.
Case Three: Skin Findings

Photos courtesy of Anthony Mancini, MD
Case Three: Question 1

Based on Daniel’s history and this image of his rash, what is the most likely diagnosis?

A. Congenital candidiasis
B. Erythema toxicum neonatorum
C. Transient neonatal pustular melanosis
D. Nonspecific viral exanthem
E. Infantile acropustulosis
Case Three: Question 1

Answer: C

Based on Daniel’s history and this image of his rash, what is the most likely diagnosis?

A. Congenital candidiasis (generalized scaling and erythema in an unwell baby, can test with KOH)
B. Erythema Toxicum Neonatorum (Erythematous macules and papules that rapidly progress to pustules on an erythematous base)
C. Transient Neonatal Pustular Melanosis
D. Nonspecific viral exanthem (highly unlikely after birth, usually associated with prodromal symptoms, doesn’t present with pustules)
E. Infantile acropustulosis (lesions typically are pruritic and limited to hands and feet)
Differential Diagnosis

- Erythema toxicum neonatorum
- Congenital candidiasis
- Acropustulosis of infancy
- Nonspecific viral exanthem
Transient Neonatal Pustular Melanosis (TNPM): Clinical Presentation

- Benign, asymptomatic and self-limited skin condition
- Mainly seen in healthy newborns with skin of color (5%); however, it can also be seen in caucasian infants (0.6%)
- The cause of TNPM is unknown but it has not been associated with any more serious underlying illnesses.

**Morphology:** characterized by vesicles, superficial pustules and pigmented macules. Vesicles and pustules are fragile and may present with a rim of surrounding scale

**Distribution:** usually located on the chin, neck, forehead, chest, buttocks, and less often on palms and soles
TNPM: Diagnosis

• Diagnosis of TNPM is clinical, based upon history and morphology of the lesions
• When there is doubt about the diagnosis, a Wright stain of a vesicle/pustule can be completed

**Histology:** smear shows numerous neutrophils and Gram stain is negative

**Culture:** should always be negative in TNPM
What would you advise Daniel’s parents?
A. Daniel can go home with 7 day course of oral antibiotics (Cephalexin 25mg/kg/d)
B. Daniel will need extensive work up to rule out neonatal sepsis
C. Topical steroids (Hydrocortisone 1% cream) will improve Daniel’s rash
D. Daniel doesn’t need any treatment. Papules and pustules will resolve in couple of days, but the residual hyperpigmentation may last for 3-6 months.
Case Three: Question 2

Answer. D

What would you advise Daniel’s parents?

A. Daniel can go home with 7 day course of oral antibiotics (Cephalexin 25mg/kg/day) (Daniel hasn’t have any infection and doesn’t need any antibiotics)

B. Daniel will need extensive work up to rule out neonatal sepsis (TNPM is a benign condition and doesn’t require further work up)

C. Topical steroids (Hydrocortisone 1% cream) will improve Daniel’s rash (Topical steroids are not indicated in TNPM)

D. Daniel doesn’t need any treatment. Papules and pustules will resolve in couple of days, but the residual hyperpigmentation may last for 3-6 months.
Case Four

Emma
Case Four: History

**ID:** 10-day-old female

**HPI:** Emma’s mother reports that her baby has recently developed a rash on the trunk and she thinks that this might be a milk allergy. Emma is fed with formula since birth. She is afebrile, has no vomiting or diarrhea and is otherwise healthy baby

**PMH:** 37 week, normal pregnancy and vaginal delivery

**FHx:** Mother is 40 year old and had asthma as a child. There is no history of medications during or after pregnancy.
Case Four: Skin Findings
Case Four: Question 1

What would you tell Emma’s mother regarding her daughter's diagnosis?

A. Emma has milk allergy and she needs to take an amino-acid based infant formula.
B. Emma has a self-limited viral infection and she doesn’t need any treatment.
C. Emma’s rash is due to sweat retention caused by partial closure of eccrine structures. Avoiding overheating will improve her rash.
D. Emma has eczema and she will need topical steroids and moisturizer.
Case Four: Question 1

Answer. C

What would you tell Emma’s mother regarding her daughter's diagnosis?

A. Emma has milk allergy and she needs to take and amino-acid based infant formulas

B. Emma has a self limited viral infection and she doesn’t need any treatment

C. Emma’s rash is due to sweat retention caused by partial closure of eccrine structures. Avoiding overheating will improve her rash

D. Emma has eczema and she will need topical steroids and moisturizer
Miliaria: Clinical Presentation

- Miliaria is a common skin condition that affects about 15% of newborns.
- It is caused by blockage (occlusion) of the sweat ducts.
- More common in warm climates or in febrile, overdressed babies.

**Morphology**
Clinical presentation differs according to level of eccrine obstruction.

Three distinguishable subtypes are described:

- **Miliaria crystallina**: 1-2mm vesicles (clear fluid) without surrounding erythema (obstruction is superficial).
- **Miliaria rubra** (heat rash): small, erythematous, papules and vesicles (obstruction is deep intraepithelial).
- **Miliaria pustulosa**: considered a variant of miliaria rubra with severe inflammatory response (obstruction is deep intraepithelial).
Miliaria: Clinical subtypes

Miliaria crystallina

Miliaria rubra

Miliaria pustulosa
Miliaria: Diagnosis and Treatment

**Distribution:** Often affects forehead, neck and upper trunk

**Prognosis:** Usually resolve within a few days with cooling and removing occlusive clothing. Vesicles and pustules erode leaving mild desquamation that may last for hours to days.

**Diagnosis:** Is made clinically based on morphology of the lesions.

**Treatment:** Avoidance of overheating, removal of excess clothing, cooling baths and air conditioning are recommended for treatment and prevention of new lesions.
Case Five

Jacob
**Case Five: History**

**ID:** 4-week-old male

**HPI:** At Jacob’s one-month old visit, his adoptive mother tells you about a skin rash present on his face, scalp, retroauricular area and diaper area

**PMH:** full-term, vaginal birth.

**FHx:** Mom adopted Jacob when he was 2 weeks old and has no information regarding his biological parents
Case Five: Skin Findings
Case Five: Question 1

Based on the previous image what is the morphology of Jacob’s rash?

A. Inflammatory papules and pustules
B. Erythematous plaques and greasy scales
C. Well defined plaques with thick adherent scale
D. Clustered vesicles and crusting
E. Large hyperpigmented thick scales
Case Five: Question 1

Based on the previous image what is the morphology of Jacob’s rash?

Answer. B

A. Inflammatory papules and pustules (commonly seen in neonatal acne)

B. Erythematous plaques and greasy scales

C. Well defined plaques with thick adherent scale (usually present in psoriasis)

D. Clustered vesicles and crusting (characteristic of HSV infection)

E. Large hyperpigmented thick scales (common clinical feature of Icthyosis)
Seborrheic dermatitis (SD) : Clinical Presentation

**Epidemiology**
- SD usually occurs in infants between the ages of 3 weeks and 12 months
- It presents in the neonatal period in about 10% of children and affects around 7% of children between their first and second year of life

**Morphology**: characterized by erythema, greasy scales, and salmon-colored oval scaly patches.

**Distribution**: predilection for scalp ("cradle cap"), face, forehead, eyebrows, trunk, intertriginous and flexural areas including diaper area

**Etiology**: precise etiology is unknown, but the yeast *Malassezia furfur* has been implicated on its pathogenesis
Seborrheic dermatitis in diaper area

Well demarcated, pink plaques, less scale than in other areas
Jacob’s rash hasn’t improved despite that mom was told that it would self limited in couple of weeks. What would be the next step to treat Jacob?

A. Oral terbinafine for 2 weeks
B. Clobetasol ointment 0.05% BID
C. Low potency topical steroids and mineral oil
D. Tacrolimus (Protopic®) oint 0.03%
E. Salicylic acid and Coal Tar
Case Five: Question 2

Jacob’s rash hasn’t improved despite that mom was told that it would self limited in couple of weeks. What would be the next step to treat Jacob?

Answer. C

A. Oral terbinafine for 4 weeks (antifungal often prescribed for fungal infections of hair, nails or diffuse in the body)
B. Clobetasol ointment 0.05% BID (ultrapotent topical steroid not commonly used in newborns)
C. Low potency topical steroids and mineral oil (they have shown to improve neonatal/infantile SD)
D. Tacrolimus (Protopic®) (immunomodulador usually prescribed to treat eczema)
E. Salicylic acid and Coal Tar shampoo (may be indicated for SD in adults but not in newborns)
Seborrheic Dermatitis: Prognosis and Treatment

Prognosis
- Neonatal SD has a good prognosis, usually self-resolves within several weeks to months; however, clears quickly after appropriate topical therapy
- 8% of children may have persistent SD, but the link between infantile and adult seborrheic dermatitis remains unclear

Treatment
- Many don’t require any treatment
- Low potency topical steroids and petrolatum or mineral oil may be considered particularly if itchy
- Topical antifungal creams may help secondary colonization with pityrosporum/yeast
- Tar-containing and Selenium sulfide shampoos may be used if the lesions persist.
- Salicylic acid is not recommended because of concerns about systemic absorption
Case Six
Nolan
Case Six: History

**ID:** 2-week-old male

**HPI:** Nolan was brought to your clinic by her mother because he has developed small blisters on the diaper area and on the leg.

**PMH:** Full term, vaginal delivery.

**FHx:** Mother is a healthy, single 24-year-old.
Case Six: Skin Findings
Based on Heather’s history and these images of Heather’s rash, what is the most likely cause of her skin findings?

A. Adenovirus
B. Herpes simplex virus
C. Incontinentia pigmenti
D. Langerhans’ cell histiocytosis
E. Transient neonatal pustular melanosis
Case Six: Question 1

Answer: B

Based on Heather’s history and these images of Heather’s rash, what is the most likely cause of her skin findings?

A. Adenovirus (Respiratory distress and fever are the main symptoms. No specific skin findings are found)
B. Herpes simplex virus
C. Incontinentia pigmenti (vesicles have a linear distribution (Blaschko’s lines) skin biopsy shows eosinophils and there is peripheral eosinophilia)
A. Langerhans’ cell histiocytosis (skin rash presents as reddish-brown papules or papulo-vesicular lesions. Tzanck preparation would reveal histiocytes and absence of multinucleate giants cells)
B. Transient neonatal pustular melanosis (the original lesions are vesiculo-pustules. Multinucleated giant cells would not be present on Tzanck preparation)
Differential Diagnosis

Adenovirus Exanthem
- Maculopapular, non-specific rash

Incontinentia Pigmenti
- Linear vesicular rash

Langerhans’ cell histiocytosis
- Reddish/brown papules and papulo/vesicles
Neonatal Herpes Simplex Virus (HSV)

- HSV may be acquired in utero, perinatally, or postnatally
- It is more common to see HSV infection during perinatal or neonatal period

Neonatal HSV is be classified into three main syndromes:
- Localized skin, eye, and mouth (SEM)
- Central nervous system (CNS) with or without SEM
- Disseminated disease involving multiple organs
Morphology and Distribution

• Localized SEM disease is characterized by:
  – Skin: Clusters or coalescing 2-4 mm vesicular lesions with surrounding erythema (vesicles progress to pustules, and later crusting)
  – Eyes: excessive tearing, eye pain, conjunctival edema
  – Mouth: localized small ulcers

*Infants with evidence of SEM disease should undergo a thorough evaluation for CNS and disseminated disease
Neonatal HSV: Clinical Presentation

Neonatal HSV may present with additional signs:

<table>
<thead>
<tr>
<th>CNS Abnormalities</th>
<th>Sepsis-Like Illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Seizures (focal or generalized)</td>
<td>• Respiratory distress</td>
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<tr>
<td>• Lethargy</td>
<td>• Apnea</td>
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<tr>
<td>• Irritability</td>
<td>• Abdominal distension</td>
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<td>• Tremors</td>
<td>• Ascites</td>
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<tr>
<td>• Poor feeding</td>
<td>• Progressive pneumonitis</td>
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<tr>
<td>• Fever</td>
<td>• Temperature dysregulation</td>
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<tr>
<td>• Hypothermia</td>
<td>• Hepatitis</td>
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<tr>
<td>• Full anterior fontanel</td>
<td>• Thrombocytopenia</td>
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</tbody>
</table>
The diagnosis of neonatal HSV infection may be established through:

- Tzanck-stained smears of lesions
- Isolation of HSV in culture from surface sites or blood
- HSV PCR assay from surface sites or blood
- Detection of HSV DNA in the cerebrospinal fluid or blood using polymerase chain reaction (PCR) assays
- Detection of HSV antigens using rapid direct immunofluorescence assays or enzyme immunoassays

Negative HSV cultures, PCR, and rapid tests do not exclude neonatal HSV

- Electroencephalography and neuroimaging are performed in neonates with suspected CNS involvement
You confirm the diagnosis of HSV, which of the following treatments is most appropriate?

A. Oral cephalalexin
B. Parenteral acyclovir
C. Supportive care
D. Topical docosanol
E. Topical imiquimod
Answer: B
You confirm the diagnosis of HSV, which of the following treatments is most appropriate?

A. Oral Cephalexin (this antibiotic would not be effective in this viral infection)

B. Parenteral acyclovir (this should be initiated as soon as possible to prevent progression of HSV to CNS and disseminated infection)

C. Supportive Care (early treatment with acyclovir can prevent progression of HSV to CNS and disseminated infection)

D. Topical docosanol (over-the-counter antiviral used in cold sores. It is not indicated for this condition)

E. Topical imiquimod (is an immune response modifier indicated for skin cancer and some cases of genital warts)
HSV: At risk infants

**Prognosis:** early diagnosis and treatment is critical. Treatment can prevent progression from localized SEM to CNS and disseminated infections. Untreated disseminated neonatal HSV has a mortality rate exceeding 80%.

**Referrals:** pediatric infectious disease specialist, ophthalmologist if there is ocular involvement and pediatric dermatologist can help confirm the diagnosis and rule-out other diagnoses.

All infants exposed to HSV should be monitored for evidence of infection during the first six weeks of life.
Case Seven

Hector
Case Seven: History

**ID:** 1 day/old male

**HPI:** presents at birth with multiple, papulonodular, reddish-brown erythematous lesions and crusts of different sizes located on the face, trunk, upper and lower limbs

**PMH:** full-term male infant, delivered by cesarean section

**FHx:** Mother is a single parent and healthy 32-year-old. No history of medications or infections during pregnancy
During your physical examination, Hector presents the following findings. He is afebrile and has no other anomalies associated.
Case Seven: Question 1

Based on Hector’s history and lesional morphology, what is the most likely diagnosis?

A. Acropustulosis of infancy
B. Neonatal Lupus
C. Incontinentia pigmenti
D. Langerhans’ cell histiocytosis
E. Transient neonatal pustular melanosis
Case Seven: Question 1

Based on Hector’s history, cutaneous lesions, skin biopsy and laboratory finding, what is the most likely diagnosis?

A. Acropustulosis of infancy (extremely pruritic, tense vesiculopustules presented mainly on hands and feet)
B. Neonatal Lupus (annular erythematous plaques with a slight scale, usually seen on the scalp, neck, or face. Histology shows interface dermatitis with vacuolar degeneration in the basal cell layer.
C. Incontinentia pigmenti (vesicles have a linear distribution (Blaschko’s lines) skin biopsy shows peripheral eosinophilia)
A. Langerhans’ cell histiocytosis
B. Transient neonatal pustular melanosis (the original lesions are a vesiculopustulas. Skin biopsy shows sterile lesions with few neutrophils)
Work-up for LCH

- Routine blood work normal
- Serological test for TORCH (toxoplasmosis, rubella, cytomegalovirus, herpes and syphilis) are negative
- Skull, chest and long bone X-rays and abdominal ultrasound were normal
- Skin biopsy shows histiocyte aggregates with granulomatous formation in the middle and deep reticular dermis
- Immunohistochemical tests are positive for CD1A/S100
Differential Diagnosis

- Acropustulosis of infancy
- Incontinentia pigmenti
- Neonatal Lupus
Neonatal Langerhans cell Histocytosis

- Neonatal LCH often presents early with cutaneous findings, however some infants can progress to multisystem involvement and thus interval follow up is recommended
- This variant usually manifests at birth or during the neonatal period
- Usually normal delivery following a normal-term pregnancy is reported

**Morphology:** multiple reddish-brown papules than can later become crusts (most common). Other manifestations: vesicles, pustules, plaques, scaly patches, blue nodular skin infiltrates (blueberry muffin syndrome), hemorrhagic bullae, and hemangioma-like lesions.

**Distribution:** head, neck, and distal extremities. May be localized or widespread. Solitary lesions in 25% of the cases. Rarely extracutaneous involvement seen (lymph nodes, liver, soft tissue, CNS, bone, lungs)
Neonatal LCH: Diagnosis

**Diagnosis:** suspected with clinical findings, confirmed with skin biopsy

**Histopathologic findings:** CD-1A positive staining and Birbeck granules on electron microscopy

**Work-up should include:** Baseline investigations should include complete blood cell count, liver function tests, coagulation studies, chest radiography, skeletal surveys, and urine osmolality testing.

Other studies may be considered depending on the clinical presentation to rule out other conditions or multi-system disease: Gram stain, skin scrapings for scabies, potassium hydroxide and Tzanck preparations, bacterial, viral, and fungal cultures and TORCH serologies, abdominal US or other imaging studies depending on clinical presentation.
Neonatal LCH: Prognosis

- In many cases, the prognosis is good with resolution of the cutaneous lesions within 3-4 months. However, due to the risk of multi-system disease in the future, regular follow up is recommended.
- Residual hypopigmented, hyperpigmented, or atrophic scars has been reported.
- Patients with evidence of extracutaneous involvement should be referred to oncology for further work up and treatment.
### Summary table – Transient benign rashes

<table>
<thead>
<tr>
<th></th>
<th>Erythema toxicum neonatorum</th>
<th>Benign cephalic pustulosis</th>
<th>Transient neonatal pustular melanosis</th>
<th>Miliaria</th>
<th>Seborrheic dermatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
<td>24-48 hours</td>
<td>2\textsuperscript{nd} and 3\textsuperscript{rd} week of life</td>
<td>Present at birth</td>
<td>Days to weeks</td>
<td>3 weeks to 12 months</td>
</tr>
<tr>
<td><strong>Morphology</strong></td>
<td>Erythematous macules, papules and pustules on erythematous base</td>
<td>Inflammatory papules and pustules; no true comedones</td>
<td>Vesicles, superficial pustules and pigmented macules, rim of scale</td>
<td>Small vesicles, vesicles with surrounding erythema, papules, small pustules</td>
<td>Erythema, greasy scales, and salmon-colored oval scaly patches</td>
</tr>
<tr>
<td><strong>Distribution</strong></td>
<td>Face, trunk, buttocks, and proximal extremities</td>
<td>Forehead, nose, and cheeks</td>
<td>Chin, neck, forehead, chest, buttocks, and less often on palms and soles</td>
<td>Forehead, neck and upper trunk</td>
<td>Scalp, face, forehead, eyebrows, trunk, intertriginous and flexural areas</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>5-7 days</td>
<td>6-12 months of age</td>
<td>Few days, pigmentation 3-6 months</td>
<td>Few days</td>
<td>Weeks to months</td>
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<tr>
<td></td>
<td>Neonatal HSV</td>
<td>Neonatal LCH</td>
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<tr>
<td><strong>Onset</strong></td>
<td>Perinatal, postnatal</td>
<td>Birth, neonatal period</td>
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<tr>
<td><strong>Morphology</strong></td>
<td>Clusters of 2-4 mm vesicules with surrounding erythema (vesicles progress to pustules, and later crusting) Mouth: small ulcers</td>
<td>Multiple reddish-brown papules, later become crusts. Other morphologies also seen.</td>
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<tr>
<td><strong>Distribution</strong></td>
<td>Any where in the body</td>
<td>Head, neck, and distal extremities. Rarely extracutaneous.</td>
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<tr>
<td><strong>Diagnosis</strong></td>
<td>Tzanck smear, culture, PCR, rapid immunofluorescence assays or enzyme immunoassays</td>
<td>Skin biopsy CD-1A positive staining and Birbeck granules on electron microscopy</td>
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<tr>
<td><strong>Work-up</strong></td>
<td>Rule out CNS involvement and eye involvement</td>
<td>CBC, serum chemistries, liver function tests, coagulation studies, and urine osmolarity</td>
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<tr>
<td><strong>Prognosis</strong></td>
<td>Good for early diagnosis, untreated disseminated neonatal HSV 80% mortality</td>
<td>Usually good, resolution in 3-4 months. Patients should be followed for progression/recurrence. 3% risk of mortality, 10% chance of relapse.</td>
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Acknowledgements

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References


To take the quiz, click on the following link:

https://www.aad.org/quiz/newborn-skin-disease-rashes-learners