DERMATOLOGIC INFECTIONS IN CHILDREN

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DERMATOLOGICAL INFECTIONS

**BACTERIAL**
- IMPETIGO/SSS
- FOLLICULITIS, FURUNCULOSIS

**FUNGAL**
- TINEA VERSICOLOR
- DERMATOPHYTOSIS
- CANDIDA

**VIRAL**
- HAND FOOT AND MOUTH DISEASE
- MOLLUSCUM CONTAGIOSUM
6 YEAR OLD BOY

- SKIN LESIONS OF 4 DAYS DURATION

- GOLDEN YELLOW CRUSTS ON SHALLOW EROSIONS ON FACE

- NOT TENDER, NOT ITCHY, SLIGHT FEVER

DIAGNOSIS???????
Rapid evolution: Erythematous macule → papulovesicle → pustule → superficial erosions with honey-colored crusts ("mamaso")

- Not tender, not painful, +/- fever
- Areas: face, extremities, buttocks
- Etiologic agents: Mainly *Staph aureus*, sometimes GABHS
Typical clinical presentation of Impetigo Contagiosa (Mamaso)

Starts with a single 2-4 mm erythematous macule

Vesicles form

Vesicles easily rupture

Several individual or coalesced macules/patches

Direct extension rapidly follows

Form “honey-colored” crusts

Courtesy of Dr. B. Bince
3 year old girl
-Skin lesions of 3 days duration
-See superficial blister on left underarm
Diagnosis????
BULLOUS IMPETIGO

• Staph aureus produces epidermolysin (exfoliatoxin)

• Cleavage of superficial layer of epidermis
  → formation of a superficial blister Bullos impetigo or erosion of epidermis (mamaso)
Blister has been unroofed → erosion

Courtesy of Dr. R. Romero-Francisco
Impetigo Contagiosa: Management

- Topical antibiotics:
  1. few, localized lesions
  2. superficial lesions
  3. asymptomatic child

  Meds: Mupirocin, Fusidic acid 3x a day

- Oral antibiotics if multiple and widespread:
  Cloxacillin, Erythromycin
13 month old baby girl

1 day duration of whole body erythema with superficial erosions

Baby is very irritable

Diagnosis???????
Staphylococcal Scalded Skin Syndrome or SSSS

- A child less than 5 y/o with diffuse tender erythema ➔ scarlatiniform eruption accentuated in flexures and periorificial areas ➔ “wrinkled” appearance and superficial desquamation
- Severe cases with diffuse sterile flaccid blisters and erosions
SSSS: Recognition

- **Characteristic facies**: peri-orificial erythema and scaling → distinctive radial crusting and fissuring

- May have pharyngitis, conjunctivitis and superficial erosions of the lips with sparing of oral mucosa
Staphylococcal Scalded Skin Syndrome (SSSS)

- A toxin mediated infection
- Due to exfoliative toxins A, B released by *Staphylococcus aureus* phage Type II
SSSS: Management:

Remember that this is a Systemic Staph infection

- Anti-Staph antibiotics for 7-10 days
- Aggressive fluid and electrolyte management
- Denuded phase: NSS compresses
- Desquamation phase: emollients
- Heals without scarring in 10-14 days
2 year old boy with pustules over the upper lip of 4 days duration

Painful

Diagnosis??
## Major Bacterial Infections of the Skin

### Folliculitis, Furuncles and Carbuncles

<table>
<thead>
<tr>
<th>Medical History</th>
<th>Complications</th>
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<tbody>
<tr>
<td>Involves hair follicle</td>
<td>Rare</td>
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<td>Often occurs in the axillae, face and buttocks</td>
<td>If untreated, may spread to deeper layers of the skin and form carbuncles with multiple sinuses</td>
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<table>
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<tr>
<th>Clinical Findings</th>
<th>Pathogen</th>
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<tr>
<td>Lesions initially similar to impetigo but go on to ulcerate, penetrate the epidermis and extend into the dermis</td>
<td>Staphylococcus aureus</td>
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<tr>
<td>Advanced lesions covered by greenish-yellow crusts</td>
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<tr>
<td>Pain, tenderness, erythema</td>
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Furuncles and Carbuncles

If single and not involving the dangerous triangle of the face: simple incision and drainage may suffice.

May apply topical mupirocin on surrounding skin to avoid inoculation with pathogen.
Comparison of Bacterial Isolates:

<table>
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<th>*1995</th>
<th>**2005</th>
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<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>84.5%</td>
<td>85.5%</td>
</tr>
<tr>
<td>Sensitivity to Oxacillin</td>
<td>97.7%</td>
<td>55.4%</td>
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*Romero R, et. al. Bacterial Isolates among primary and secondary skin infections in the community. Research paper in fulfillment of fellowship. Phil Children’s Medical Center

Why the sudden change?

- Possibilities: (Philippine scenario)
  - Incomplete intake of prescribed antibiotics
  - Self medication – availability of antibiotics from local drugstores w/o prescription
  - Application of “penicillin” powder on infected wounds
What is MRSA (CDC Definition)?

MRSA is, by definition, any strain of \textit{Staphylococcus aureus} bacteria that has developed \textit{resistance} to \textit{beta-lactam antibiotics} which include the penicillins (methicillin, dicloxacillin, nafcillin, oxacillin, etc.) and the cephalosporins.

Community acquired MRSA is a hybrid strain from a previously hospitalized patient who developed MRSA and the strain normally found in the community.
The resistance of MRSA to beta-lactam antibiotics is due to the presence of the \textit{mecA} gene sequence.

The \textit{mecA} gene produces \textit{transpeptidase PBP2a} (penicillin-binding peptide) that decreases the bacterial affinity of the beta-lactam antibiotics.

Most CA-MRSA hybrid strains may acquire a virulence factor not seen with HA-MRSA.
Most cases do not need hospitalization

For furuncles and carbuncles:
- Incision and drainage
- Get culture and sensitivity
- Initiate antibiotic therapy
  - Trimethoprim 160 mgs, Sulfamethoxazole 800 mgs: 1 tablet 2 x a day or
  - Clindamycin HCl 450 mgs 3x a day

Recognition of Severe MRSA infection

No improvement or worsening after 2 days of antibiotics.

Severe pain.

Fever, nausea, vomiting, other constitutional signs and symptoms
Management of CA-MRSA

• Most cases do not need hospitalization
• For furuncles and carbuncles:
  – Incision and drainage
  – Get culture and sensitivity
  – Initiate antibiotic therapy
    • Trimethoprim 160 mgs, Sulfamethoxazole 800mgs: 1 tablet 2 x a day or
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Note: in severe cases: HOSPITALIZE

Frei, C.R.  TMP or Clindamycin for CA-MRSA Skin Infections. J AM Board of Fam Med 2010:23(6):714=719
2 year old boy with recurrent crops of carbuncles and furuncles responsive to oral cloxacillin.

Problem: Why recurrent?
Recurrent Furunculosis

- Frequent attacks of furuncles/carbuncles: (1 or more episodes per month despite oral antibiotics)

Look for source of staphylococcus!

May have to do culture of anterior nares of patient or caregiver(s)

If +: Apply mupirocin 4x a day for 5 days to anterior nares

Or Rifampicin plus Cloxacillin for 7 days
Recurrent Staph infections

• Look for the source of infection (auto-inoculation? Personal contact?)

• “Reservoirs” of Staph aureus:
  1. anterior nares
  2. ears
  3. throat
  4. hands
  5. axillae
  6. perineum/anus
Algorythm for recurrence

Mupirocin BID-QID x 5 days applied on the internal nares

Culture other sites (perineum, fingernails, Toe webs, axilla)

Add rifampicin

Or
Rifampicin plus minocycline
Rifampicin plus co-trimoxazole

**MRSA

Fungal Infections
Candida
Pityriasis versicolor
Tinea capitis
Infant with “diaper rash” of one week duration
No response to cortisone cream
Diagnosis?
Diaper Candidiasis

Note:
Satellite pustules
Glazed, beefy red shiny skin

Diagnosis:
Candidal Diaper Dermatitis
Other signs of candidal infection:

- Fine scaling on border of erythematous lesions
- White cheesy material

Courtesy of Dr. R. Romero-Francisco
Diaper Candidiasis: Recognition

- usually presents as well demarcated erythema with peripheral scale and satellite papules/pustules
- inguinal creases are involved
- in some instances, erythema has been described as “beefy red”
White plaque difficult to scrape

Courtesy of Dr. R. Romero-Francisco
Oral Thrush: Recognition

- “Thrush”: pseudomembranous Candidiasis
- white to gray, “cheesy” looking colonies that form pseudomembranes
- gentle removal reveals a raw red base
Candidiasis: Management

• Topical anti-candidal agent (nystatin or an azole preparation) +/- topical steroid
• NOTE: after the eruption has cleared, continue the anti-candidal agent for three more days
• Oral mycostatin or fluconazole if recurrent and extensive
16 year old male

Increasing number of hypopigmented patches

Asymptomatic

Other lesions on upper chest

Diagnosis???
KOH Smear
• Small round to oval macules or minimally elevated plaques with “wrinkling” and superficial scale (“fingernail sign”)
• Lesions may be erythematous to brownish to hypopigmented (“an-an”)
Pityriasis Versicolor: Recognition

- Most common on the chest, back, and proximal arms
- Face involved in younger children
- May be mildly pruritic
- Etiologic agent: *Pityrosporum ovale* or *Malassezia furfur*
Pityriasis versicolor: Management

- Selenium sulfide or Zinc pyrithione 10-15 mins/day for 1-2 weeks
- Ketoconazole shampoo 5 mins/day for 3 days
- Ketoconazole cream
- Oral ketoconazole discouraged
- Advise on residual pigmentation
12 year old girl with a mass on L parietal area, asymptomatic

Several weeks duration + cervical lymph nodes but appears to worsen with anti-biotics

Diagnosis????
Note the mass: Boggy and soggy erythe-matous mass (Kerion)

Presence of alopecia

Diagnosis: Tinea Capitis
Another presentation of Tinea capitis:

Suspect in a prepubertal child with scaly alopecia

Courtesy of Dr. R. Romero-Francisco
KOH smear
Oral anti-fungals:
1. Griseofulvin: 15-25 mkd (max: 1 g/d) 6-12 weeks
2. Terbinafine: 3-6 mkd face/body/scalp: 2-4 weeks

Ketoconazole shampoo
4 year old boy with shallow small ulcers on tongue

Has difficulty eating and with low grade fever

Similar lesions on hands, feet and buttocks

Diagnosis??????
Distinct pattern: Hand, Foot and Mouth distribution
Lesions vary: maculopapular, roseola-like, urticarial, but most common is vesicular
Usual evolution: erythematous small macules and papules → superficial gray vesicles on an erythematous base → some may ulcerate, leaving superficial scabs
Shallow grayish ulcer on erythematous base
• Hand, Foot and Mouth disease
  > areas involved: mouth, hands and feet, buttocks; may also be seen on face and extremities
  > rash usually lasts for 2-7 days
  > (+/-) fever, sore mouth, anorexia, malaise, abdominal pain
5 year old child with multiple flesh colored papules on trunk

Asymptomatic but increasing in number

Diagnosis???
Molluscum Contagiosum

Note:

Flesh colored papules

Central umbilication

Not inflamed as a rule
Flesh colored papules

Central umbilication
Molluscum contagious: Recognition

- Flesh colored to pinkish to pearly white discrete papules with central umbilication
- Most common areas: axillae, lateral trunk, lower abdomen, thighs, face
- May have a dermatitis in 10% of cases
- Etiologic agent: Molluscipox virus
Molluscum contagiosum: Management

- “Benign neglect”: spontaneous resolution in 6-9 months
- May have a more persistent, progressive course

**Tx options:**
1. Curettage
2. topical Cantharidin
3. Tretinoin cream
4. Imiquimod cream
Molluscum contagiosum: What can the Pediatrician do?

- Recognize
- Refer
- Please do not give topical steroids
- May try:
  1. Tretinoin or Imiquimod
  2. nail polish??!!
BACTERIAL
  IMPETIGO/SSS
  FOLLICULITIS, FURUNCULOSIS

FUNGAL
  TINEA VERSICOLOR
  DERMATOPHYTOSIS
  CANDIDA

VIRAL
  HAND FOOT and MOUTH DISEASE
  MOLLUSCUM CONTAGIOSUM
THANK YOU FOR YOUR KIND ATTENTION