Childhood Skin Infections

Evidence Updates

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Objectives

- At the end of lecture, learner will be able to:
  - » Diagnose common viral, bacterial, fungal, and parasitic skin infections in children
  - » Apply best evidence to manage common childhood skin infections
  - » Differentiate benign versus serious skin diseases associated with international travel

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Case #1

- 6 year-old girl
- 5-month hx of 5mm hyperkeratotic papule w/ capillary loops (black dots)
- Location: finger

Diagnosis:

- ***Verruca vulgaris (common wart)***

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Verruca vulgaris

- Etiology: HPV type 2
- Location: hands and feet
- Transmission: self-inoculation, vertical, sexual
- Prevalence: highest in childhood; rare in infancy[1]

Natural history[2]:

- 65% resolve in **2** yrs, 80% resolve in **4** yrs
- 1 and 2
- 2 and 4
- 3 and 6

Factors associated with duration of >2yrs:

- Hx of infections
- >1 anatomic site involved

1. Cochrane Database Syst Rev. 2012 Sep 12;(9):CD001781.
2. Pediatr Dermatol. 2015 Sep-Oct;32(5):679-83.

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Management[1]

- Salicylic acid (SA)
  - » Only modestly effective
- Cryo = placebo
- SA = cryo
- *For hand warts,*
  - » Cryo better than SA and observation
- Aggressive better than gentle cryo
  - » >10-15 seconds
  - » 2 cycles
- Treatment interval:
  - » Q2wks = Q3 = Q4
- Other tx:
  - » *Silver nitrate* may be effective
  - » Other tx no more effective than placebo
    - Duct tape, 5FU, laser, imiquimod, intralesional antigen
  - » No RCT for surgery, podophyllotoxin, cantharidin

1. Cochrane Database Syst Rev. 2012 Sep 12;(9):CD001781.

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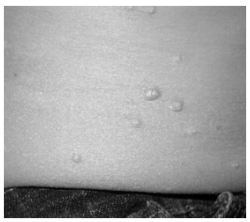
Case #2

- 5 year-old boy
- 3-week hx of pearly papules w/ central umbilication
- Location: trunk & extremities



Diagnosis:

- ***Molluscum contagiosum***

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Molluscum contagiosum

- Etiology: pox virus
- Location: trunk & extremities
- Variants: genital, perioral
- Incidence: 12-14 per 1000 children; highest among 1-4 yo[3]
- Prevalence: warm climate[4]; rare in infancy, median age 5 yo[5]

Natural history[5]:

- 50% resolve in **12** mos, 70% resolve in **18** mos
- 6 and 12
- 12 and 18
- 24 and 36
  - » *Tx did not shorten duration[5]*
  - » Eczema associated with more lesions[5]
  - » 41% transmission rate among siblings[6]

3. Fam Pract. 2014 Apr;31(2):130-6.
4. Cochrane Database Syst Rev. 2009 Oct 7;(4):CD004767.
5. Pediatr Dermatol. 2016 Sep-Oct;33(5):679-83.
6. Lancet Infect Dis. 2015 Feb;15(2):190-5.

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Management

- Lack of efficacy[7]
  - » Imiquimod
  - » Cantharidin
  - » Salicylic acid
  - » Phenol, alcohol
  - » Benzoyl peroxide
  - » Tretinoin
  - » Curettage
- Avoid imiquimod[8]
  - » Ineffective
  - » Adverse outcomes (neutropenia)

7. Cochrane Database Syst Rev. 2009 Oct 7;(4):CD004767.
8. JAMA Dermatol. 2015 Feb;151(2):125-6.

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Case #3

- 2 year-old boy w/ fever
- Erythematous papulo-vesicles
- Location: hand, feet, and oral cavity

Diagnosis:

- ***Hand-foot-and-mouth disease (HFMD)***

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Hand-foot-and-mouth disease

- Etiology: enterovirus (coxsackie A6 and A16)
- Location: hand, foot, mouth
- Beyond bastion areas: buttocks, extremities, trunk, perioral[9]
  - » >3 areas in 88% cases
  - » ≥5 areas in 42% cases
  - » *No scalp involvement*
- Mean age: 26 mos
- Gender: 1.5:1 (M:F)
- Natural history:
  - » **A6, A16** – benign course
  - » **EV 71** – 1998 Taiwan epidemic[10]
    - 78 deaths of 129,106 cases
    - Complications: pulmonary hemorrhage, aseptic meningitis, encephalitis, acute flaccid paralysis, myocarditis
- **Treatment:** supportive
- Return to school[11]: when afebrile, even w/ lesions

9. Pediatr Infect Dis J. 2014 Apr;33(4):e83-8.
10. N Engl J Med. 1999 Sep 23;341(13):929-35.
11. Renko M. Evidence-based medicine guidelines. Article ID: ebm01102 (029.063)

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Case #4

- 7 year-old boy
- Prodrome: fever
- Painful vesicles, pustules and erosions w/ crust and erythema
- Location: lips, oral cavity

Diagnosis:

- ***Herpes simplex infection (herpetic gingivostomatitis)***

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Herpes simplex infection

- Etiology: HSV 1 & 2
- Common forms: gingivostomatitis, herpetic whitlow
- Less common forms:
  - » Genital
  - » Eczema herpeticum
  - » Ocular
  - » HSV encephalitis
  - ** Index of suspicion*
- **Treatment:**
  - » Supportive
  - » Antiviral therapy for the ill child
    - Acyclovir
    - Valacyclovir
    - Famciclovir
- Daycare exclusion[11]: not recommended for common forms

11. Renko M. Evidence-based medicine guidelines. Article ID: ebm01102 (029.063)

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Case #5

- 1 year-old girl
- Flaccid bullae, followed by erythematous erosions w/ crust and scales
- Location: trunk, extremities

Diagnosis:
- ***Bullous impetigo***

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Impetigo

- Etiology: *Staph, Strep*
- Types: primary, secondary
- Forms:
  - » Non-bullous
    - *Staph*, *Strep*
    - Face, extremities
  - » Bullous
    - *Staph* only
    - Trunk, extremities
- **Treatment[12]:**
  - » Non-extensive impetigo
    - topical mupirocin and fusidic acid ≥ oral abx
  - » Extensive impetigo
    - Insufficient evidence for best treatment
    - PCN inferior to erythromycin and cloxacillin
- Return to school[11]:
  - » 24 hrs after oral abx
  - » 48 hrs after topical abx

11. Renko M. Evidence-based medicine guidelines. Article ID: ebm01102 (029.063)
12. Cochrane Database Syst Rev. 2012 Jan 18;1:CD003261.

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Cellulitis and Abscess

- Etiology: *Staph, Strep*
- POCUS: improves accuracy[13]
  - » Clinical exam: Sn/Sp 44%/42%
  - » Exam w/POCUS: Sn/Sp 78%/61%
- **Cellulitis Treatment**:
  - » Blood cx not recommended
  - » Abx monotherapy covering MSSA and beta-hemolytic *Strep*[14]
    - **cephalexin**
- **Purulent Cellulitis Treatment**:
  - » Abx monotherapy initially
  - » *Add* MRSA coverage if not responding
    - **TMP-SMX, clindamycin, tetracyclines (>8yo)**
- **Abscess Treatment**:
  - » I&D
  - » Abx w/ MRSA coverage if persistent or recurrent
  - » **Analgesia; packing**[15,16]

13. Acad Emerg Med. 2013 Jun;20(6):545-53.
14. Clin Infect Dis. 2013 Jun;56(12):1754-62.
15. Curr Opin Pediatr. 2015 Jun;27(3):303-7.
16. Am J Emerg Med. 2012 Jan;30(1):104-9.

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Case #6

- 1 year-old boy
- 2-week hx of erythematous patch w/ mild scale and satellite lesions
- Location: R scrotum, *including* inguinal fold

Diagnosis:
- ***Genital candidiasis***

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Mucocutaneous candidiasis

- Etiology: *Candida albicans*
- Location: oral (thrush), genital
- Presentation:
  - » Erythematous patches or plaques
  - » Adherent greyish-white papules or plaques
  - » Wetness or maceration
  - » Satellite lesions

Treatment:
- Any location:
  - » Oral triazole[17] (fluconazole)
- Oral (thrush):
  - » Oral nystatin
- Genital:
  - » Topical nystatin
  - » Topical imidazoles (eg, clotrimazole, econazole, miconazole)

17. Cochrane Database Syst Rev. 2010 Jul 7;(7):CD001972.

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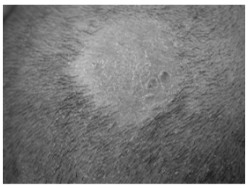
Case #7

- 4 year-old boy
- 3-month hx of focal alopecia w/ crust, scale and scarring



Diagnosis:
- ***Tinea capitis***

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Tinea capitis

- Etiology[18]:
  - » *Trichophyton spp.*
    - *Trichophyton tonsurans* (USA)
    - endothrix
  - » *Microsporum spp.*
    - ectothrix
- Affected age: 3-9 yo
- Presentation:
  - » Localized alopecia, pruritus, scale, crust, black dots, occipital adenopathy

Diagnosis[18]:
- KOH exam of hair
- Fungal cx

Treatment[19]:
- *Trichophyton spp.*
  - » Griseofulvin = terbinafine = itraconazole = fluconazole

  ** Trichophyton tonsurans*: **terbinafine preferred**
- Microsporum spp.
  - » **Griseofulvin preferred**

18. Pediatr Rev. 2012 Apr;33(4):e22-37.
19. Cochrane Database Syst Rev. 2016 May 12;(5):CD004685.

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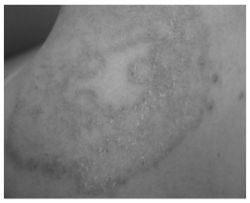
Case #8

- 8 year-old girl
- 2-week hx of pruritic, erythematous, annular plaque w/ scales
- Location: L trapezius



Diagnosis:
- ***Tinea corporis***

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Tinea corporis

- Etiology[18]:
  - » *Trichophyton, Microsporum, and Epidermophyton*
- Presentation:
  - » Solitary erythematous pruritic annular plaque (or few plaques)
- Location:
  - » trunk, extremities

Diagnosis[18]:
- Clinical dx
- KOH of skin scrapings

Treatment[20]:
- Similar efficacy and safety for topical terbinafine, naftifine, and imidazoles

18. Pediatr Rev. 2012 Apr;33(4):e22-37.
20. Cochrane Database Syst Rev. 2014 Aug 4;(8):CD009992.

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Case #9

- 8 month-old girl
- 3-week hx of papules, burrows, and excoriations
- Distribution: abdomen, chest, extremities, hands, chin

Diagnosis:
- ***Scabies***

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Scabies

- Etiology: *Sarcoptes scabiei* mite
- Presentation:
  - » intense nocturnal pruritus, papules, burrows, excoriations

  ** Infants*: vesicles, pustules
- Distribution:
  - » Web spaces, periumbilical, periareolar, axilla, buttocks, groin
  - » Atypical areas – scalp, palms, soles

Diagnosis[21]:
- Burrows on skin exam
- Microscopy: mites, eggs, feces

Treatment[21,22]:
- Topical permethrin has strongest evidence of efficacy and safety
- Oral ivermectin (wt >15kg)
- Topical lindane

Return to school[11]: 24 hrs

11. Renko M. Evidence-based medicine guidelines. Article ID: ebm01102 (029.083)
21. Pediatr Ann. 2009 Jun;38(6):326-32.
22. Cochrane Database Syst Rev. 2007 Jul 18;(3):CD000320.

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Skin Conditions Associated with Travel

- Red flags: fever, rash
- 5 common conditions[23]:
  - » Cutaneous larva migrans
  - » Dog bites
  - » Insect bites
  - » Cutaneous leishmaniasis
  - » Skin abscesses
- Serious conditions[23]:
  - » Dengue
  - » Meningococcemia

Evaluation[23]:
- Guided by disease epidemiology
- Dxtic clue: eosinophilia

Treatment[23]:
- Specific to etiologic agent

Transmission risk[23]: low

23. J Am Board Fam Med. 2010 Nov-Dec;23(6):704-13.

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Practice Recommendations

- If cryotherapy is chosen for hand warts, recommend monthly intervals between treatments and use aggressive cryotherapy. (*SORT A*)
- Due to lack of convincing evidence of efficacy, do not treat molluscum contagiosum. Treatment has no effect on duration of disease. (*SORT A*)
- Use topical mupirocin to treat non-extensive impetigo. (*SORT A*)
- Use griseofulvin, terbinafine, itraconazole or fluconazole to treat *Trichophyton* tinea capitis; use terbinafine for confirmed cases of *T. tonsurans*. For tinea capitis caused by *Microsporum*, use griseofulvin. (*SORT A*)

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References

1. Cochrane Database Syst Rev. 2012 Sep 12;(9):CD001781.
2. Pediatr Dermatol. 2015 Sep-Oct;32(5):679-83.
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13. Acad Emerg Med. 2013 Jun;20(6):545-53.
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17. Cochrane Database Syst Rev. 2010 Jul 7;(7):CD001972.
18. Pediatr Rev. 2012 Apr;33(4):e22-37.
19. Cochrane Database Syst Rev. 2016 May 12;(5):CD004685.
20. Cochrane Database Syst Rev. 2014 Aug 4;(8):CD009992.
21. Pediatr Ann. 2009 Jun;38(6):326-32.
22. Cochrane Database Syst Rev. 2007 Jul 18;(3):CD000320.
23. J Am Board Fam Med. 2010 Nov-Dec;23(6):704-13.

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