Adult Cutaneous Fungal Infections 2: Yeasts

Basic Dermatology Curriculum

Last updated November 27, 2013
Module Instructions

- The following module contains a number of blue, underlined terms which are hyperlinked to the dermatology glossary, an illustrated interactive guide to clinical dermatology and dermatopathology.
- We encourage the learner to read all the hyperlinked information.
Goals and Objectives

- The purpose of this module is to help medical students develop a clinical approach to the evaluation and initial management of patients presenting with cutaneous fungal infections.

- By completing this module, the learner will be able to:
  - Identify and describe the morphologies of superficial fungal infections
  - Describe the correct procedure for performing a KOH examination and interpreting the results
  - Recommend an initial treatment plan for an adult with tinea versicolor, candidal intertrigo, and seborrheic dermatitis
Case Four

Ms. Anna Jones
Case Four: History

- **HPI:** Ms. Jones is a 27-year-old woman who presents with mild itchiness of her back which began mid summer. She is also concerned about areas on her back that are darker than the surrounding skin.
- **PMH:** asthma
- **Medications:** occasional multivitamin
- **Allergies:** no known drug allergies
- **Social history:** spends her summer months in Florida and is an avid runner.
Case Four: Skin Exam

How would you describe these exam findings?
Well-demarcated, hyperpigmented macules and patches, across the back.
Case Four, Question 1

Which of the following is the most likely diagnosis?

a. Pityriasis alba
b. Seborrheic dermatitis
c. Tinea corporis
d. Tinea versicolor
e. Vitiligo
Case Four, Question 1

Answer: d

Which of the following is the most likely diagnosis?

a. Pityriasis alba (noninfectious, asymptomatic poorly-defined areas of hypopigmentation; self-limited)

b. Seborrheic dermatitis (abnormal immune response to normal skin yeast causing scaling and crusting)

c. Tinea corporis (fungal skin infection, presents as erythematous annular lesions with central clearing)

d. Tinea versicolor

e. Vitiligo (autoimmune loss/dysfunction of melanocytes causing areas of complete depigmentation)
Diagnosis: Tinea Versicolor

- Tinea versicolor (aka Pityriasis versicolor) is *not* caused by a dermatophyte
- It is a colonization caused by species of *Malassezia*, a lipophilic yeast that is a normal resident in the keratin of the skin and hair follicles of individuals at puberty and beyond
- Tends to recur annually in the summer months
Tinea Versicolor

- Characterized by well-demarcated, tan, salmon, or hypopigmented or hyperpigmented patches, occurring most commonly on the trunk and arms
- Macules will grow, coalesce and various shapes and sizes are attained in an asymmetric distribution
- Visible scale is not often present, but when rubbed with a finger or scalpel blade, scale is readily seen
  - This is a diagnostic feature of tinea versicolor
  - Evoked scale will disappear after treatment
A Closer Look at Tinea Versicolor
Tinea Versicolor: Morphology

- It’s called “versicolor” because it can be light, dark, or pink to tan.
  - In untanned Caucasians, the lesions may be salmon-colored or brown.
  - In tanned Caucasians, the lesions may appear pale in comparison to the surrounding skin.
  - In darker skinned individuals, lesions may appear hyper- or hypopigmented.

- Let’s look at some examples of the various colors of tinea versicolor.
Examples of Tinea Versicolor

- Light spots
- Dark spots
- Pink or tan spots

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Case Four, Question 2

Which of the following is the most appropriate next step in management?

a. Fungal culture
b. KOH exam
c. Skin biopsy
d. Wood’s light exam
Case Four, Question 2

Answer: b

Which of the following is the most appropriate next step in management?

a. Fungal culture (Malassezia spp. are easily identified by a KOH exam but are not easily cultured)

b. KOH exam

c. Skin biopsy (too invasive; KOH is better)

d. Wood’s light exam (mild fluorescence may be present but not as sensitive as KOH exam)
The KOH exam shows short hyphae and small round spores. Characteristic “spaghetti and meatball” pattern.
Microscopy with dye added to the specimen

Characteristic “spaghetti and meatball” pattern corresponding to hyphae and spores.

Magnification 40x
Case Four, Question 3

Which of the following treatments would you recommend for Ms. Jones?

a. Antifungal shampoo
b. Hydroquinone cream
c. Nystatin cream
d. Oral terbinafine
Answer: a

Which of the following treatments would you recommend for Ms. Jones?

a. **Antifungal shampoo**

b. Hydroquinone cream (this bleaching cream is not an appropriate treatment)

c. Nystatin cream (not effective)

d. Oral terbinafine (in contrast to tinea corporis, this is not very effective in tinea versicolor)
1. Shampoos: selenium sulfide 2% shampoo, ketoconazole shampoo, zinc pyrithione shampoo
   • Apply daily to affected areas, wait 10 minutes, then rinse
   • Repeat daily for 1-4 weeks
   • As effective as oral therapy

2. Imidazole creams: ketoconazole, clotrimazole
   • Apply daily or bid for 1-4 weeks
   • Very effective for limited areas
   • Usually more expensive than shampoos due to surface area
Tinea Versicolor: Oral treatment

- Oral medication may be used when topical therapy fails, if the benefits outweigh the risks or the patient has a strong preference for oral therapy.

- Oral medications of choice include:
  - Fluconazole 300 mg / week for 2-4 weeks
  - Itraconazole 200 mg / day for 7 days or 100 mg / day for 14 days

- Warn about dangers: hepatotoxicity, drug interactions, GI side effects, congestive heart failure, etc.

- Monitor liver function if giving more than 7 days.
Tinea Versicolor: Maintenance Therapy

- Many patients relapse
- If the patient has had more than one previous episode, recommend maintenance therapy
- Maintenance therapy: topicals are used 1-2x/week
  - Ketoconazole shampoo, Selenium sulfide (2.5%) lotion or shampoo, Zinc pyrithione (bar or shampoo)
  - Leave on for 10 minutes before rinsing off
- Refer concerned patients who fail maintenance therapy
Case Five

Ms. Betty Raskin
Case Five: History

- **HPI:** Ms. Raskin is a 62-year-old woman who presents with a red itchy rash beneath her breasts.
- **PMH:** Type 2 diabetes (last hemoglobin A1c 9.2%), obesity.
- **Medications:** Metformin, which she says she often does not remember to take.
- **Family history:** noncontributory.
- **Social history:** lives in Texas part-time.
Which of the following best describe these characteristic exam findings?

a. Well-demarcated red plaques with overlying thick silvery scale
b. Grouped vesicles on an erythematous base
c. Sharply defined red plaques involving the skin folds with surrounding satellite macules
d. Inflammatory nodules
Case Five, Question 1

Answer: c

Which of the following best describe these characteristic exam findings?

a. Well-demarcated red plaques with overlying thick silvery scale
b. Grouped vesicles on an erythematous base
c. Sharply defined red plaques involving the skin folds with surrounding satellite macules
d. Inflammatory nodules
Case Five, Question 2

Which of the following is the most likely diagnosis?

a. Atopic dermatitis
b. Candidal intertrigo
c. Psoriasis
d. Seborrheic dermatitis
e. Tinea cruris
Case Five, Question 2

Answer: b
Which of the following is the most likely diagnosis?

a. **Atopic dermatitis** (chronic eruption of pruritic, erythematous, oozing papules and plaques, usually with secondary lichenification and excoriation)

b. **Candidal intertrigo**

c. **Psoriasis** (characterized by well-demarcated, erythematous papules and plaques with overlying silvery scale)

d. **Seborrheic dermatitis** (typical skin findings range from fine white scale to erythematous patches and plaques with greasy scale)

e. **Tinea cruris** (dermatophytosis of the groin, genitalia, pubic area, perineal, and perianal skin, usually appears as multiple erythematous papulovesicles with a well-marginated, raised border)
Intertrigo: Basic Facts

- Intertrigo = inflammation of large skin folds
  - Inframammary fold, gluteal cleft, inguinal creases, and folds under pannus (abdomen)
- Up to 10% of intertrigo is complicated by Candida yeast colonization
  - Classic symptom: burns more than itches
  - Classic sign: satellite macules, papules, or pustules around the erythema in the fold
  - KOH exam may reveal pseudohyphae, but fungal culture may be more sensitive than KOH for Candida
Candidal intertrigo

Classic satellite papules seen in *Candida* intertrigo

Consider doing a fungal culture if diagnosis uncertain
Case Five, Question 4

Which of the following is the most appropriate next step in management?

a. Clotrimazole cream
b. Oral prednisone
c. Oral terbinafine
d. Wear tighter, supportive clothing made of synthetic fabrics
Case Five, Question 4

Answer: a

Which of the following is the most appropriate next step in management?

- a. Clotrimazole cream (better activity against Candida than nystatin)
- b. Oral prednisone (may worsen the infection)
- c. Oral terbinafine (not effective for Candida)
- d. Wear tighter, supportive clothing made of synthetic fabrics (it’s the opposite: loose cotton clothing is best)
Intertrigo Management

Prevention

• Keep intertriginous areas dry, clean, and cool
  • Dry areas after bathing with hair dryer on cool setting; repeat twice daily
• Encourage weight loss for obese patients
• Wear loose clothing made of cotton
Candidal Intertrigo Management

Topical antifungal agents

• Imidazoles: miconazole, clotrimazole, econazole
  • More effective than nystatin, but cream formulations may burn. Warn patients to expect this.
  • Also treat dermatophytes in case you’re not sure

• Polyene: nystatin
  • Only works for *Candida*, not dermatophytes
  • Has advantage of powder and ointment formulations

• Allylamines (terbinafine, naftifene) are **not** effective for *Candida* yeast
Candidal Intertrigo: Management

Topical anti-inflammatory

- Low strength corticosteroid preparations rapidly improves the itching and burning
- Desonide ointment or 1% hydrocortisone ointment twice daily for 1-2 weeks
  - Ointments burn less than creams when applying
  - Longer use can cause steroid atrophy, so avoid
  - Alternatively may use tacrolimus ointment 0.1%, which does not cause atrophy
Case Six

John Wong
Case Six: History

- **HPI:** Mr. Wong is a 59 year-old man with several years of redness and scaling on his forehead, eyebrows, and central face. It improves slightly with moisturizers and does not itch. It does not worsen with heat, exercise, or alcohol.
- **PMH:** none
- **Allergies:** none
- **Medications:** allopurinol
- **Family History:** non-contributory
- **Social History:** accountant
Case Six: Skin Exam
How would you describe the rash on Mr. Wong’s face?

a. Erythematous patches with overlying scale
b. Lichenified plaques with silvery scale
c. Papules and pustules
d. Vesicles and crust
Case Six, Question 1

Answer: a

How would you describe the rash on Mr. Wong’s face?

a. Erythematous patches with overlying scale
b. Lichenified plaques with silvery scale
c. Papules and pustules
d. Vesicles and crust
Case Six, Question 2

What is the most likely diagnosis?

a. Actinic keratoses
b. Allergic contact dermatitis
c. Atopic dermatitis
d. Rosacea
e. Seborrheic dermatitis
Case Six, Question 2

Answer: e

What is the most likely diagnosis?

a. Actinic keratoses (scaly is greasy, not keratotic)
b. Allergic contact dermatitis (he does not itch)
c. Atopic dermatitis (very itchy; no history of this)
d. Rosacea (no history of typical triggers; usually telangiectasias or papules, not scaling)
e. Seborrheic dermatitis
Seborrheic dermatitis

- **Seborrheic dermatitis** is a very common inflammatory reaction to the *Malassezia (Pityrosporum ovale)* yeast that thrives on seborrheic (oil-producing) skin
  - Inflammatory reaction to normal flora
  - This is a chronic condition that can be controlled but not cured
- Presents as erythematous scaling patches on the scalp, hairline, eyebrows, eyelids, central face and nasolabial folds, external auditory canals, or central chest
- Seborrheic dermatitis is often worse in patients with HIV
Here are some examples of seborrheic dermatitis
Seborrheic dermatitis
Seborrheic dermatitis

Often hypopigmented in darker skin types
Seborrheic dermatitis

- Favors central chest
- May be erythematous, hypopigmented
- If partially treated, may be just a few papules
Case Six, Question 3

Which of the following would be an appropriate treatment for Mr. Wong?

a. Clobetasol propionate cream
b. Desonide cream (mild steroid, low potency)
c. Erythromycin ointment
d. Nystatin cream
e. 5-fluorouracil cream
Answer: b

Which of the following would be an appropriate treatment for Mr. Wong?

a. Clobetasol propionate cream (too potent)
b. Desonide cream (mild steroid, low potency)
c. Erythromycin ointment (this is not bacterial)
d. Nystatin cream (for *Candida* yeast species, not *Malassezia* species)
e. 5-fluorouracil cream (for actinic keratoses)
Seborrheic dermatitis treatment

- Topical ketoconazole twice daily
  - Reduces yeast counts; choose vehicle based on patient
- Low-potency topical steroid (e.g. desonide) are safe to use for flares on the face
  - Use twice daily for 1-2 weeks for flares
- Antidandruff shampoo for scalp, chest
  - Ketoconazole, selenium sulfide, zinc pyrithione shampoos
  - Lather, leave on 10 minutes, rinse; repeat 3-5x/week
- Refer patients who fail these therapies
## Summary: Adult Fungal Treatment

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<thead>
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<th>Condition</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Line</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; Line</th>
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<tbody>
<tr>
<td>Tinea pedis</td>
<td>Clotrimazole Miconazole cream</td>
<td>Terbinafine Naftifene Butenafine cream or gel</td>
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<td>Tinea corporis</td>
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<td>Tinea cruris</td>
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<tr>
<td>Tinea versicolor</td>
<td>Selenium sulfide, zinc pyrithione shampoo</td>
<td>Oral fluconazole or itraconazole</td>
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<tr>
<td>Candida</td>
<td>Clotrimazole Miconazole cream or Nystatin powder, ointment</td>
<td>Desonide or 1% hydrocortisone ointment</td>
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<tr>
<td>Seborrheic dermatitis</td>
<td>Ketoconazole cream</td>
<td>Desonide or 1% hydrocortisone for flares</td>
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Take Home Points

- Tinea versicolor is characterized by well-demarcated, tan, salmon, or hypopigmented patches, occurring most commonly on the trunk. KOH confirms the diagnosis.
- *Candida* intertrigo classically has satellite macules and papules or pustules around patches of erythema.
- Topical treatment is usually appropriate as a first-line agent for tinea versicolor, candidal intertrigo, and seborrheic dermatitis.
- Tinea versicolor and seborrheic dermatitis are chronic conditions requiring maintenance therapy.
- Monitoring for recurrence and maintenance treatments may be helpful in patients with recurrent infection.
Acknowledgements

- This module was developed by the American Academy of Dermatology Medical Student Core Curriculum Workgroup from 2008-2012.
- Primary authors: Iris Ahronowitz, MD; Ronda Farah, MD; Sarah D. Cipriano, MD, MPH; Raza Aly, PhD, MPH; Timothy G. Berger, MD, FAAD.
- Peer reviewers: Heather Woodworth Wickless, MD, MPH, FAAD; Daniel S. Loo, MD, FAAD.
- Revisions and editing: Sarah D. Cipriano, MD, MPH; John Trinidad. Last revised by Patrick E. McCleskey, MD, FAAD, October 2013.
References

To take the quiz, click on the following link:

https://www.aad.org/quiz/adult-fungal-learners