

# Acne

# Module Instructions

- The following module contains hyperlinked information which serves to offer more information on topics you may or may not be familiar with. We encourage that you read all the hyperlinked information.

# Acne Vulgaris: Basic Facts

- Acne vulgaris often referred to as “acne” is caused by inflammation of pilosebaceous follicles.
  - Typically presents ages 8-12 as the first sign of puberty, peaks at ages 15-18, and resolves by age 25
  - Affects 90% of adolescents, affects races equally, and there is often a family history
  - 12% of women and 3% of men will have acne until age 44
  - In women it is not uncommon to have a first outbreak at 20-35 years of age

# Acne Vulgaris: Types

- There are many morphologies seen in acne including open and comedones, papules, pustules, and cysts (inflammatory nodules on the fat).
  - Comedones are the hallmark lesion of acne vulgaris
- Acne comedo is a mild form that involves only the presence of comedones, or blackheads
- Papular acne is a form with more papules and pustules that occurs in individuals with coarse/oily skin
- Permanent scarring and cysts are sequelae of acne and therefore acne must be treated aggressively!

# Case 1

# Case 1: History

- HPI: 18-year-old healthy adolescent that presents with 2 years of “pimples” on his face. He washes his face regularly and reports that he began to note increased pubic hair at the time of onset
- PMH: none
- All: none
- Meds: none
- FH: father and mother had acne as children
- SH: lives at home with parents and attends high school
- ROS: negative

# Case 1: Exam



# Acne Vulgaris Classification

- Grade 1: Open comedones
- Grade 2: Open and close comedones and some papulopustules
- Grade 3: Pustular Acne
- Grade 4: Nodulocystic Acne

# Case 1: Question 1

- Which grade of acne would you assign this patient based on his exam?
  - a. Grade 1
  - b. Grade 2
  - c. Grade 3
  - d. Grade 4

# Case 1: Question 1

**Answer: c**

- Which grade of acne would you assign this patient based on his exam?
  - a. Grade 1
  - b. Grade 2
  - c. Grade 3**
  - d. Grade 4

# Case 1: Grade 3 Acne Vulgaris



Exam: 10-20 scattered  
pustules, inflammatory  
papules, and open  
comedones

Open comedone

Inflamed papule

Pustule

**How would you grade the following acne patients?**

# Grade ? Acne Vulgaris



# Grade 2 Acne Vulgaris



On exam: 20-30  
scattered  
erythematous papules  
and comedones with  
minimal pustules

# Grade ? Acne Vulgaris



# Grade 4 Acne Vulgaris



On exam: scattered comedones, erythematous papules, cysts and some residual scarring on the face with more severe scattered pitted scars of the upper back



**Now back to Case 1**

# Case 1: Question 1

- What elements in the history are important to ask in this case?
  - a. medications for other conditions
  - b. dietary history
  - c. weight gaining and other supplements
  - d. all of the above

# Case 1: Question 1

**Answer: d**

- What elements in the history are important to ask in this case?
  - a. medications for other conditions
  - b. dietary history
  - c. weight gaining and other supplements
  - d. all of the above**

# Importance of History Items

## Medications:

A number of medication can cause or worsen acne including:

- Lithium
- Dilantin (phenytoin)
- Systemic corticosteroids
- Androgens

## Diet:

Diets with high glycemic load may also worsen acne. Lowering the glycemic load of the diet may improve acne. Chocolate and oils in the diet are NOT causal except through this mechanism.

## Weight gain and supplements:

If a young patient is gaining weight and on supplements, anabolic steroids should be explored

# Case 1: Question 2

- Which is(are) pathogenically related to the appearance of acne vulgaris?
  - a. bacteria in the hair follicle
  - b. androgens in the circulation
  - c. follicular plugging
  - d. sebum secretion
  - e. all of the above

# Case 1: Question 2

## Answer: e

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  - d. sebum secretion
  - e. all of the above**

# Acne Vulgaris: Pathogenesis

- Acne Vulgaris is related to 4 factors:
  - 1. Presence of hormones (androgens)
  - 2. Sebaceous gland activity (increased in presence of androgens)
  - 3. *P. acnes* (bacteria) in the hair follicle (it lives on the oil and breaks it down to free fatty acids which cause inflammation)
  - 4. Plugging of the hair follicle as a result of abnormal keratinization of the upper portion

# Case 1: Question 3

- Which of the following agents are effective in treating acne vulgaris?
  - a. oral antibiotics
  - b. topical benzoyl peroxide
  - c. topical retinoids
  - d. all of the above

# Case 1: Question 3

**Answer: d**

- Which of the following agents are effective in treating acne vulgaris?
  - a. oral antibiotics
  - b. topical benzoyl peroxide
  - c. topical retinoids
  - d. all of the above**

# Treatment of Acne Vulgaris

- The treatments for acne are directed at one or more of the 4 causative factors.
- In combining agents therapeutically, agents with activity against different pathogenic causes should be used (e.g. topical antibiotic plus tretinoin)
- Acne causes facial disfigurement and scarring is difficult to treat!
  - Aggressive prevention is important

# Acne Vulgaris: Treatments

- There are two main classes of treatments:
  - Antibacterials – prevents bacterial component
    - Topical: Erythromycin, clindamycin, sulfur, benzoyl peroxide
    - Systemic: Tetracycline, doxycycline, minocycline
  - Anti-comedonal – affects keratinization
    - Topical: Tretinoin [Retin-A], adapalene [Differin], benzoyl peroxide
    - Systemic: Accutane (isotretinoin)
- Washing the face DOES NOT help to prevent acne

# Guidelines for Acne Vulgaris Treatment

- Grade 1/2: Benzoyl Peroxide, topical antibiotics, topical sulfur, Retin A
- Grade 3: Oral antibiotics PLUS adequate topical therapy; hormonal therapy
- Grade 4: Oral Antibiotics; Accutane

# Typical Treatment Regimen

GRADE	TREATMENT OPTION
Grade 1	Tretinoin [Retin-A]*, adapalene [Differin], benzoyl peroxide
Grade 2	Benzoyl peroxide**, topical antibiotics (erythromycin 2%, clindamycin 1%), Tretinoin [Retin-A]*, adapalene [Differin]
Grade 3	Oral antibiotics, typically either tetracycline 500mg bid-qid, doxycycline 100mg or minocycline 100 qd-bid Combining with benzoyl peroxide may decrease resistance. Resistance highest with tetracycline
Grade 4	Accutane (isotretinoin) starting at 0.5mg/kg up to 1mg/kg divided in 2 doses for ~5mo May lead to remission of acne

\*Available in cream, gel, solution with 0.025% cream the weakest and 0.05% solution the strongest. Most common is 0.025 and 0.05% creams for less irritation.

\*\*Available in 2.5, 5, 10% gel and cream as well as combined gels with erythromycin and clindamycin

# Side Effects

- A common side effect of topical agents (especially benzoyl peroxide and tretinoin) is skin drying, Retin-A can cause severe erythema.
- A common side effect of oral tetracyclines is GI upset and is also contraindicated in pregnancy and children <10 years old
  - Up to 5% of patients will get vaginitis or perianal pruritus from Candida
  - Minocycline can cause vertigo and is rarely implicated in lupus like syndrome
- Accutane absolutely contraindicated in pregnancy and patients must be enrolled in a pregnancy prevention program, iPLEDGE
  - Can elevate triglycerides
  - Typically LFTs, lipid panel, CBC are monitored.
  - 80-90% will be colonized by staph aureus following treatment; mupirocin applied nasally can prevent this

# Accutane

- It is difficult to prescribe accutane and requires paperwork, so when is it indicated in acne?
  - Severe cystic (grade 4) acne
  - Poorly responsive acne improving <50% after 6 months of oral and topical combined therapy
  - Acne with scarring or psychological distress
  - Gram negative folliculitis

# Cosmetics and Acne

- Cosmetics are labeled as “non-comedogenic” if they do not cause or exacerbate acne
- Many sunblocks and moisturizers may exacerbate acne so products must be selected carefully
- Overaggressive washing and the use of particulate abrasive scrubs often exacerbates acne and should be avoided (you can not scrub out the plugs in your pores)

# Case 2

# Case 2: History

- HPI: A 22 year old female patient comes in stating that she has started to develop acne that she did not have before.
- PMH: none
- All: none
- Meds: none
- FH: none
- SH: pt lives in the city and attends college. She has poor diet and exercise habits due to lack of time and has gained 40 pounds over the past 4 years.
- ROS: some new upper lip and chin hair growth and irregular menstrual cycles

# Case 2: Exam



On exam:

Gen: pt is well appearing in NAD, but overweight

Skin: 30-40 scattered comedones, erythematous papules some with overlying crust on the cheeks.

Some fine black terminal hairs noted on the upper lip and chin as well as hair loss on the frontal and parietal scalp (androgenetic alopecia)



# Case 2: Question 1

- The patient was given spironolactone and her acne resolved. Why did this medication work?

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  - a. the diuretic effect of spironolactone eliminated sodium resulting in less sebum
  - b. the spironolactone has anti-androgenic effects
  - c. spironolactone has anti-comedonal activity
  - d. spironolactone when used appropriately has anti-bacterial activity

# Case 2: Question 1

- The patient was given spironolactone and her acne resolved. Why did this medication work?
  - a. the diuretic effect of spironolactone eliminated sodium resulting in less sebum (not true)
  - b. the spironolactone has anti-androgenic effects**
  - c. spironolactone has anti-comedonal activity (not true)
  - d. spironolactone when used appropriately has anti-bacterial activity (not true)

# Androgen Excess in Acne

- The patient has likely polycystic ovarian syndrome (PCOS)
  - Weight gain and “metabolic syndrome” is a common cause of this disorder
  - Hirsutism results from increased circulating androgens
- Some women with acne after adolescence have hormonally driven acne
- In women past the age of 25, treatment of androgen excess can improve acne.
- Commonly used agents are:
  - Spironolactone 50mg -100mg daily
  - OCP's (oral contraceptives)

# Case 3

# Case 3: History

- HPI: 33-year-old female complains of red cheeks for the past year.
- PMH: none
- All: none
- Meds: none
- FH: none
- SH: homeless, chronic alcoholic
- ROS: negative

# Case 3: Exam



On exam:

Facial erythema with papules and pustules on the nose and cheeks as well as some scattered papules and pustules on the forehead and chin

**NO COMEDONES**

# Case 3: Question 1

- What is the most likely diagnosis?
  - a. systemic Lupus Erythematosus
  - b. bacterial folliculitis with cellulitis
  - c. acne rosacea
  - d. pellagra from niacin deficiency

# Case 3: Question 1

**Answer: c**

- What is the most likely diagnosis?
  - a. systemic lupus erythematosus (does not present with pustules)
  - b. bacterial folliculitis with cellulitis (pt does not have acute or systemic symptoms)
  - c. acne rosacea**
  - d. pellagra from niacin deficiency (would expect scale but not pustules)

# Acne Rosacea: Basic Facts

- Acne rosacea is a chronic inflammatory condition located at the “flush” areas of the face (nose, cheeks > brow, chin)
- It is more common in women
- It is most often in people of middle age (30-50)
- Affected persons blush easily

## Case 3: Question 2

- Which of the following might trigger this patient's rosacea?
  - a. alcohol
  - b. heat/hot beverages
  - c. sunlight
  - d. hot, spicy foods
  - e. all of the above

# Case 3: Question 2

## Answer: e

- Which of the following might trigger this patient's rosacea?
  - a. alcohol
  - b. heat/hot beverages
  - c. sunlight
  - d. hot, spicy foods
  - e. all of the above**

# Acne Rosacea Triggers

- Alcohol
- Sunlight
- Hot beverages (heat)
- Hot, spicy food
- If it makes you flush it can flare rosacea
- Rosacea is **NOT** related to androgens!!

# Clinical Features of Acne Rosacea

- Disease is typically located on the mid face including the nose and cheeks with occasional involvement of the brow, chin, eyelids, and eyes
- Patient's have erythema and telangiectasias
- Patient's also can have papules and pustules (NO COMEDONES!)
- Rhinophyma (W.C. Fields nose)
  - Dermal and sebaceous gland hyperplasia of the nose
- Ocular rosacea (keratitis, blepharitis, conjunctivitis)

# Some Examples of Rosacea

# Erythematotelangiectatic Rosacea



On exam: patient has subtle erythema on the cheeks and nose with telangiectasia scattered throughout the nose and cheeks. There are no papules, pustules, or comedones present

# Papulopustular Rosacea



On exam: pt has erythema on the nose with scattered papules and pustules. Pt also has erythema with papules and pustules on the chin

# Glandular Rosacea



On exam: pt has facial erythema of the forehead, cheeks, and nose as well as scattered papules, pustules, and cysts on the nose, cheeks, and forehead. Scattered nodulocystic lesions are also present. Pt also has rhinophyma.

# Acne Rosacea Treatment

- Medical treatment is only effective for the papulopustular and glandular variants. The underlying erythema may not respond to medical treatment.
- Treatment options include:
  - Topical Antibiotics (metronidazole)
  - Topical Sulfur
  - Oral Antibiotics (tetracyclines)
  - Isotretinoin (accutane) is considered in severe cases
- Therapy is only suppressive and thus may be required lifelong

# Using Steroids in Rosacea?

- Topical Steroids may exacerbate or induce an acneiform eruption resembling rosacea called steroid rosacea
- Treatment involves stopping the topical steroids and giving oral tetracyclines
- **NEVER** treat an undiagnosed central facial papular eruption with topical steroids. It may be rosacea which will flare severely when the topical steroids are stopped!

# Acne Rosacea Surgical Treatment

- Laser therapy can be used to improve the telangiectasias and the rhinophyma once the papulopustular component is controlled with oral or topical medications

**END OF MODULE**