

Drugs in Acne

Acne vulgaris

MALEK ZIHLIF



Drugs in Acne

- One of the most common skin diseases typically begins at puberty and affects
 - >80% of adolescents
 - >40% of adults over than 25
- Genetics plays a role
- Considerable psychological impact on the quality of life
- Effects on quality of life are comparable to those suffering from chronic diseases like asthma, seizures and diabetes...

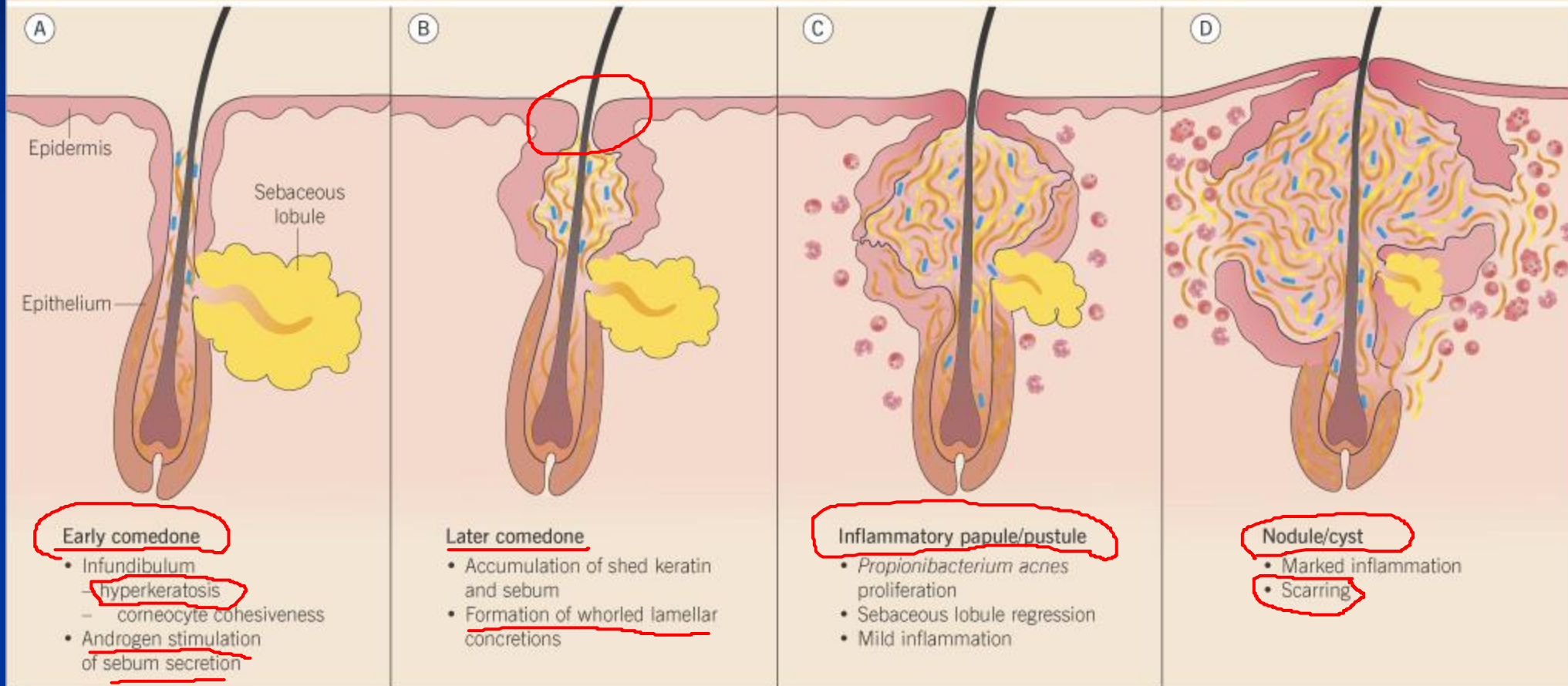


Acne

- Acne is a disorder of the pilosebaceous unit (face, neck, chest, shoulders, back)
- Increased androgen production leads to increased sebum. Abnormal keratinization and desquamation obstructs the pilosebaceous duct and *Propionibacterium acnes* (G⁺ rod) proliferates in excess sebum and breaks down sebum into free fatty acids. Proinflammatory mediators are activated and result in inflammatory acne



PATHOGENESIS OF ACNE



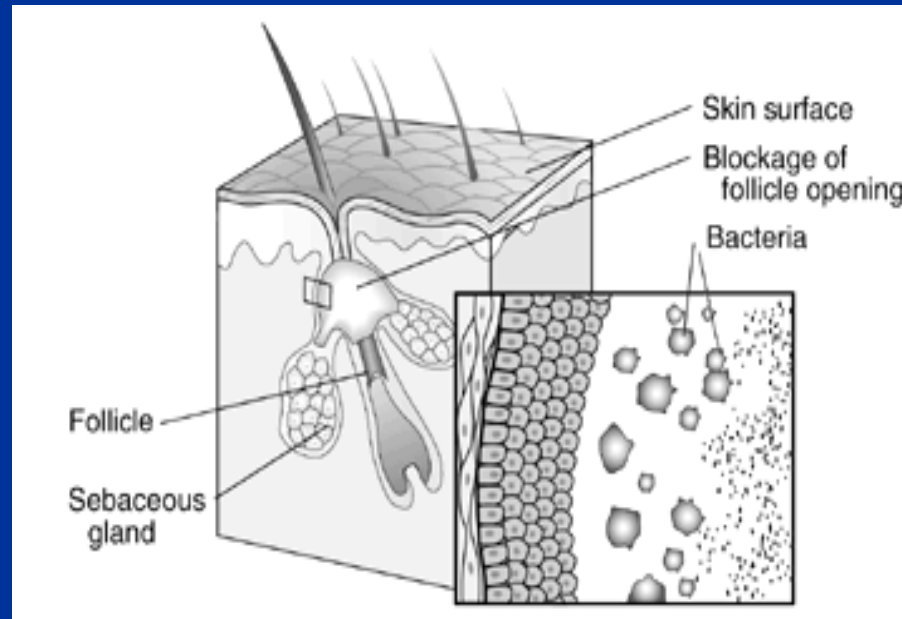
Seborrhoea is a common feature between patients with acne.

2. Abnormal production of abnormal sebum increasing the ratio of wax ester to cholesterol and cholesterol ester and is believed to be the response of sebaceous glands to DHEA



Propionobacterium acne lipases act on sebaceous fatty acid (Triglycerides) to release irritant free fatty acid and low-molecular-weight peptide an extra cellular factor that penetrate the follicular wall and stimulate Polymorphs and Lymphocytes initiating inflammation

Fig 8



Treatment of Acne – Guided by the Severity of Disease

- **Topical retinoids** are first-line: adapelene, retinoin (Retin-A) and tazarotene **Benzoyl peroxide** creams, gels and washes.
- **Topical antibiotics** (clindamycin, erythromycin, dapsone)
- **Azeleic acid**: Unique plant-derived compound that has anti-bacterial and anti-comedogenic properties (and Pregnancy Category B)
- **Salicylic and Glycolic Acid** gels and washes



Acne treatment

- Basic skin care
 - No washing, scrubbing or picking
 - Cleanse with a gentle soap, may contain salicylic acid, glycolic acid or benzoyl peroxide
 - If moisturize use noncomedogenic agent
- Based on skin type, choose appropriate vehicle for topical treatments
 - Oily skin (solutions, gels)
 - Combination (lotions)
 - Dry skin (cream, ointment)



Drugs in acne

- Retinoic acid and derivatives:

- Retinoic acid (Tretinoin, Retin-A)
- Adapalene
- Tazarotene
- Isotretinoin

Available in cream, gel and ointment dosage forms

- Benzoyl peroxide

- Azelaic acid

- Antibiotics

- Hormones



Retinoic acid and derivatives

■ Tretinoin (Retin A), Adapalene, Tazarotene

- Excellent choice for comedonal acne
- Improves follicular desquamation and dyschromia
- Anti-inflammatory action (Adapalene best)
- Use at night over entire face, exposure to the sun increases irritation
- Results in six to eight weeks. May increase concentration over time
- Degraded by prolonged exposure to the sun and when used with benzoyl peroxide (Adapalene most photostable)



■ Side effects to

- Could lead to irritation (Tazarotene most irritating, Adapalene least)
- Sun sensitivity
- Pustular eruption after 3-4 weeks of use
- Potential risk of hyper-/hypopigmentation
- Contraindicated in pregnancy (tumorigenic in animals)



Isotretinoin

- Systemic retinoid used for nodulo-cystic acne (caps.)
- Most effective treatment with remission in 60% after single course (15-24 weeks)
- Reduces sebum production
- Normalizes follicular keratinization
- Decreases inflammation
- Extremely toxic: Teratogenic (can occur with single exposure during gestation), myalgias/arthritis, photosensitivity, lipid abnormalities, pancreatitis, leucopenia, elevated platelets and ESR, proteinuria, hematuria



Benzoyl Peroxide

- Has bactericidal effect on *P.acnes*
- No evidence of resistance
- If combined with a topical antibiotic (erythromycin or clindamycin) may help in decreasing the emergence of resistant *P. acnes* species
- Has mild comedolytic action, reduces inflammation and decreases free fatty acids
- Available in cleansing liquid or bar, lotion, cream, and gel
- Adverse effects include: Irritation, bleaches clothing and hair, allergic contact dermatitis



Azelaic Acid

- Has antimicrobial activity and inhibits conversion of testosterone to dihydrotestosterone
- It is a dicarboxylic acid that is bacteriostatic against *P.acnes* and normalizes keratinization
- Most effective when used with other agents
- Comes as a gel and a cream
- Side effects uncommon
- Use in caution in teens with dark complexions due to potential risk of hypopigmentation



Topical antibacterials in Acne

Erythromycin

Clindamycin

Metronidazole

Sodium sulfacetamide



■ Erythromycin, Clindamycin

- Decrease *P.acnes* and percentage of free fatty acids
- Slow to act
- Resistance often develops over time
- Best used in combination with topical retinoids/benzoyl peroxide

■ Combination therapy

- 5% Benzoyl Peroxide and 3% Erythromycin
- 5% Benzoyl Peroxide and 1% Clindamycin
- Topical antibiotics and Azelaic acid or Tretinoin



Systemic antibiotics in acne

- Primarily used for moderate to severe inflammatory acne
- Decrease *P.acnes*
- Reduces amount of free fatty acids
- Cases with high rates of resistance to Erythromycin
- Preferred agents include Tetracycline, Doxycycline,
Minocycline



Hormonal control of acne

- Oral contraceptive pills in females
 - Increase production of sex hormone binding globulin leading to a decrease of circulating androgens
 - Decrease ovarian androgen production

Ortho tri-cyclen (ethinyl estradiol and norgestimate), Estrostep (ethinyl estradiol and norethindrone acetate) FDA approved for the treatment of acne

- Oral antiandrogens (spironolactone) can be useful
- Oral corticosteroids, short course for patients with severe inflammatory disease



Summary

- Mild acne: Topical therapy with retinoid for comedones, add Benzoyl Peroxide or topical antibiotic if mild inflammation present
- Moderate acne: Topical therapy plus oral antibiotics for inflammatory lesions, add Benzoyl Peroxide to reduce antibiotic resistance.
Consider OCP's
- Severe acne: Isotretinoin if topical therapy and oral antibiotics fail

