Drugs for Skin Diseases

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Scope

Structure & function of skin
Common inflammatory skin diseases
Acne
Dermatitis/Eczema
Dandruff & seborrheic dermatitis
Pityriasis alba
Urticaria
Infective skin
Bacterial infections
Fungal infections
Viral infections
Others:
Scabies
Melasma

Structure and Function of Skin

Skin function
- Protection
- Sensory reception
- Excretion
- Thermoregulation
  - Release sweat when we hot
  - Keep heat in when we cold
- Storage important substances for survive & live
  - Water, fat, and vit. D

Common Inflammatory Skin Diseases

Acne
- Acne is an inflammatory disorder of pilosebaceous gland
- It affect > 85% of teenagers (14-19 years) and decrease after 25 year olds
- Areas of distributions:
  - Face, neck, upper back & chest

Pathophysiology of acne
1. Hyperkeratinization
2. Increased sebum production
3. P. acnes proliferation
4. Inflammatory response initiated by bacterial antigens and cytokines

Types of Acne (I)

Figure 1: Grade I (mild) acne showing comedones with few inflammatory papules & pustules
Figure 2: Grade II (moderate) acne showing papules & pustules

Types of Acne (II)

Figure 3: Grade III (moderately severe) acne showing numerous large painful nodules & pustules as well as some inflamed nodules
Figure 4: Grade IV (severe) acne showing many large inflamed nodules & pustules as well as scarring
Drug Use for Acne: Topical products (I)

1. Retinoids
   - Tretinoin, isotretinoin, adapalene & tazarotene
   - Action:
     - Comedolytic
     - Releasing cytokine
     - Comedones & inflammatory lesions
   - S/E:
     - Irritation, erythema, scaling
     - Apply at night & start at lowest conc. with small amount

2. Topical antimicrobials
   - Benzoyl peroxide (BP):
     - 2.5%, 5%, 10%
     - Bactericidal agent
   - Action:
     - Prevent the resistance of P. acnes to antibiotic therapy
     - Moderate comedolytic & anti-inflammatory effects
     - Irritation
     - Good for inflammatory acne

3. Combination therapy
   - Retinoid (adapalene/tretionin) + Other topical products
     - BP + salicylic acid
     - 2% salicylic acid
     - Tea tree oil

Drug Use for Acne: Topical products (II)

3. Combination therapy
   - Retinoid (adapalene/tretionin) + clindamycin
   - BP + retinoid
   - BP + clindamycin/erythromycin
   - More effective than monotherapy
   - Apply at separate times

Oral Drugs and Key Points

Oral drugs
- Antibiotics:
  - Tetracycin, Doxycyclin, Minocyclin, Erythromycin
- Hormonal therapies:
  - Anti-androgen effect, decrease sebum production
  - Diann-35, Prem, Suwe, Youmin, Oleez
- Isotretinoin:
  - More S/E
  - Prescribe by physician
  - Changes abnormal follicular keratinization, decreases sebum production & P. acnes, anti-inflammatory

Key points
- Target one/more causes
- Combination therapy gives better results than monotherapy
- Topical drugs are standard for mild-moderate acne
- Systemic drugs are reserved for moderate-severe acne
- Hormonal therapies provide effective second-line treatment in women with acne

Eczema/Dermatitis

Eczema
- An inflammation of the skin (dermatitis)
- Clinical signs
  - Redness, vesicles (tiny blisters), papules, scaling, cracks and hyperkeratosis
  - Etiology
    - Contact irritants or allergens
    - Atopic dermatitis (genetic)
- Hand eczema: redness, erosions & tiny blisters accompanied by severe itching

Management of Eczema
- Avoid irritants or allergens
- Wet dressing with NSS, burrow 1:40, boric acid 3% if vesicle or blister occur
- Apply topical steroids
  - Prednisolone, betamethasone
- Oral antihistamine for itching
  - CPM, hydroxyzine
  - Not recommend topical product
- Oral steroids in severe cases
- Topical or oral antibiotic for infected lesions
  - Oral antibiotics:
    - Erythromycin, clindamycin

Dandruff and Seborrheic Dermatitis
- Chronic scalp manifestations with similar etiology
  - Hyperproliferation of epidermis
  - Increase sebum production
  - Malassezia: Pityrosporum ovale and P. orbiculare (fungal)
- Dandruff:
  - Dry & white scalp flaking without skin redness/inflammation
- Seborrheic dermatitis:
  - Redness & scaling plaques, greasy-looking with yellowish
  - Distribution areas: Rich of sebaceous glands
    - Scalp, ears, eyebrows, & nasolabial folds
Treatment

Dandruff
- Wash your hair with anti-dandruff 2 times/week
  - 1-2% ZPT
  - 1% Selenium sulfide
  - 1-3% Salicylic acid
  - 2% Ketoconazole

Seborrheic dermatitis
- Topical steroids
- Topical antifungal
- Anti-dandruff shampoo
- Topical metronidazole
- Tar shampoo
- Oral anti-histamine
- Oral antifungal

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Pityriasis alba
- Common in children between the ages of 3-16
- Characteristics:
  - Flat hypopigmented round or oval patches on the face, upper arms, neck, & shoulders
  - Some itching and/or visible scaling
- Precipitating factors:
  - Sun/wind exposure
  - Dry skin, eczema

Treatment
- Stop to expose allergens and avoid precipitating factors: alc.
- Calamine lotion/topical steroids
- Surrounding erythema
- Itching
- Allergens:
  - Drugs, flowers chemicals, perfumes, temperatures, insects

Impetigo
- A superficial skin infection, characterized by
  - Superficial erosions covered with honey-colored crusts
  - Most often on the face of children

Bacterial Infections: Strep, Stap gr. A
- Erysipelas & Cellulitis
  - Deep skin infections: Fever
  - Local pain, inflammation, edema, red & warm of skin
  - Erysipelas:
    - Infect in dermis & upper subcutaneous tissue
  - Cellulitis:
    - Infect in subcutaneous tissue, loose connective tissue

Fungal Infections
- Pityriasis versicolor
  - Caused by pityrosporum folliculitis
  - Clinical signs and areas:
    - Fine wrinkle scale, discolored patches (some brownish)
    - Rarely itching
    - Affect trunk & shoulder

- Dermatophytosis (Tinea)
  - Caused by dermatophytes
  - Clinical signs and areas:
    - Annular lesions or ringworm with active border, patch of alopecia with inflammation, papulosquamous lesion
    - Extreme itching
**Pityriasis verisicolo**
- **Topical:** 2-4 weeks
  - Wash body with shampoo daily
  - Selenium sulfide (2.5%)
  - Zinc pyrithione (1-2%)
  - Ketoconazole (2%)

- **Oral:** 2 weeks
  - Ketoconazole, Itraconazole, Fluconazole, Terbinafine

**Dermatophytosis (Tinea)**
- **Topical:** 2-4 (6-8) weeks
  - Keratolytic: Benzoic acid compound (Whitfield’s ointment)
  - Tolnaftate
  - Imidazole cream: Ketoconazole, Allylamine: Terbinafine
  - Oral: 4-6 weeks
  - Griseofulvin, Imidazole, Terbinafine
  - ADR: Hepatotoxic

**Etiology & Characteristic**
- A fungal infection of the nail caused by anthropophilic dermatophytes
- Hyperkeratosis, subungual debris, thickening, or discoloration of the nail plate

**Treatment**
- Old oral anti-fungal:
  - Griseofulvin & ketoconazole
  - Low response & high hepatotoxicity
- New oral anti-fungal:
  - Terbinafine (continuous)
  - Griseofulvin (pulsa)
  - 2 vs 3-4 pulses (fingernail/toenail)
  - Fluconazole (once a week)
  - 6-9/ 9-15 months (fingernail/toenail)

**Superficial Candidiasis (I)**
- Skin infection of *candida* species on mucosal membrane
  - Most common pathogens:
    - Candida albicans
    - Normal flora in mouth, GI, vaginal
  - Risk factors:
    - Immune deficiency (HIV/DM), long term use of ABO, contraceptive, chemotherapy
  - Oral thrush:
    - Small white, cream colored, or yellow slightly raised spots in the mouth, throat, and tongue

**Treatment**
- Oral thrush:
  - Nystatin oral suspension/ tablets
  - Clotrimazole troches
- Vulvovaginal Candidiasis
  - Vaginal & anal regions
  - Itching, burning, soreness & irritation of the vagina with white/ whitish-gray discharge, cream to cottage cheese
  - Dysuria & pain

**Superficial Candidiasis (II)**
- Candidal Intertrigo
  - Most commonly occurs in overweight patients with redundant moist and overlapping skinfolds
  - Areas:
    - Inner thighs and genitalia, armpits, under the breasts, underside of the belly, behind the ears, and the web spaces between the toes and fingers
  - Signs & symptoms:
    - Macerated & reddened areas with scaling & satellite lesions
    - Itching, ooze, & sore

**Treatment**
- Keeping the area of the intertrigo clean, dry & exposed to the air along with use of topical imidazoles
- Antibacterial soap, absorbent body powders

**Viral Infection (I)**
- Herpes simplex virus infections
  - HSV-1 & HSV-2 are cause of cold sores & genital herpes
  - Transmitted disease by contact & sexual
  - Recurrence
  - Fever blister, pain & burning
  - Precipitating factors:
    - Stress, menstrual period, fever
**Herpes zoster**
- Varicella-zoster virus (VZV)
- Primary infection called "varicella" or "chicken pox"
- Then virus establishes latency in dorsal root and cranial nerve ganglia
- Secondary infection results from reactivation of VZV and its spread from a single ganglion to the neural tissue called shingles

**Risk factors:**
- HIV infection, malignancies
- Chronic corticosteroid use, chemotherapy & radiation therapy

**Treatment**
- Supportive care
- Paracetamol for pain, fever
- Anti-histamine for itching
- Oral ABO if bacterial infected
- Topical treatment:
  - Anti-viral: Acyclovir gel
  - Oral treatment:
    - Anti-viral: acyclovir, valacyclovir
    - Oral steroid may be useful

**Warts**
- Infection of epidermal cells with the human papillomavirus (HPV)
- Results in cell proliferation & a thickened, warty papule
- Transmitted by contact

**Treatment**
- Plaster containing 40% salicylic acid
- Salicylic acid solution:
  - Con cent®, Duofilm®

**Scabies**
- Sarcoptes scabiei
- Characteristics:
  - Intense itching with superficial burrows
  - Itch is made worse by warmth & at night
  - Occur in the area of the hands, feet, wrists, elbows, back, buttocks, and external genitals
- Key points:
  - Treat all persons in family
  - Boil all clothes
  - Big cleaning room & house

**Melasma**
- Grey–brown symmetrical patches on face exposed to the sun
- Etiology:
  - Pregnancy, sun exposure, use of oral contraceptives containing estrogens and/or progestogens, & some drugs such as hydantoin

**Molluscum contagiosum**
- Molluscum contagiosum virus
- Transmitted by contact & sexual
- Characteristics:
  - Pink or flesh-colored bumps on the skin with size 3-6 mm
  - With time, the center becomes soft and indented (umbilicated) with a white curdlike core which be squeezed out easily

**Treatment**
- Clean with alcohol and apply local anesthetic, then remove it
- Apply silver nitrate
- Curettage: scrape the bumps

**Herpes simplex**
- Supportive care
- Paracetamol for pain, fever
- Anti-histamine for itching
- Topical treatment:
  - Anti-viral: Acyclovir gel
  - Oral treatment:
    - Anti-viral: acyclovir, valacyclovir
    - Oral steroid may be useful
Prevention and Drug Use for Melasma

- Use sunscreen & avoid exposure to sunlight
- Avoid to use drug induce melasma
- Tyrosinase inhibition agents
  - Hydroquinone (use with caution by physician)
  - Arbutin (bearberry extract)
  - Kojic acid
  - Licorice
  - Rice extract
- Keratolytic agents
  - Glycolic acid, AHA
- Vitamin C
  - Antioxidant
  - Important for collagen synthesis
  - Inhibit melanin production
- Vitamin E
- Glutathione
  - Inhibit tyrosinase enzyme and enhance production of pheomelanin > eumelanin

Forbidden Agents in Cosmetics

- Hydroquinone (HQ) > 2%
  - Ochronosis, hyperchromia, hypochromia, neuropathy
  - Permanent corneal damage
- Mercury derivatives
  - Neurotoxic problems:
    - Ataxia, speech & hearing impairment
  - Mental problems:
    - Irritability, depression
  - Mercury-induced nephropathy
- Topical steroids
  - Contact eczema
  - Bacterial & fungal infection
  - Cushing’s syndrome
  - Skin atrophy, acne
  - Pigmentation disorders

References