

Skin Pharmacology

Dermatological agents: the drugs that exert either a chemical or physical action on the skin to aid in the correction of a disorder of the skin.

General Considerations Involving Dermatological Agents:-

- a. The vehicles (creams, lotions, ointments, and so forth.) in which therapeutic ingredients are incorporated and diluted have been found to have pharmacological properties of their own.
- b. There is a great variation in the manner in which vehicles hold, release, or assist in the absorption of their therapeutic ingredients. Therefore, it is important that the vehicle selected to contain a therapeutic ingredient be suitable for use on the portion of skin on which it will be applied.
- c. The distribution of the therapeutic ingredient(s) throughout a vehicle is an important factor in the determination of a dermatological's effectiveness.

The used agents for treating dermatological disorders are:-

➤ Topical anti-infective agents:

Localized skin infections may require the use of a topical anti-infective. The topical anti-infective include:-

A- Topical Antibiotic agents:-

- Topical antibiotics exert a direct local effect on specific microorganisms and may be bactericidal or bacteriostatic.
- These drugs are used to prevent superficial infections in minor cuts, wounds, skin abrasions, and minor burns. Bacitracin, gentamicin, erythromycin, and neomycin are examples of topical antibiotics. Erythromycin is also indicated for treatment of acne.

B- Topical antifungal agents:-

- Antifungal drugs exert a local effect by inhibiting growth of the fungi. Examples of antifungal drugs and their uses are:
 - **Amphotericin B**: used for treatment of mycotic infections (fungal) .
 - **Miconazole, ciclopirox, and econazole**: used for treatment of ringworm (a skin infection, characterized by a reddish to brownish raised or bumpy patch of skin that may be lighter in the center, giving the appearance of a “ring.” Ringworm can occur anywhere on the body. Depending on its location, it is also known as *tinea pedis* or "athlete's foot" when on the feet, *tinea cruris* or "jock itch" when on the groin area, *tinea corporis* when on the body (where it is most commonly referred to as ringworm), or *tinea capitis* when on the scalp. Contrary to its name, ringworm is caused not by a worm but by a parasitic fungus and is medically classified as a dermatophytosis.) and superficial candidiasis.
 - **Clioquinol**: used for eczema, athlete’s foot, and other fungal infections.
 - **Nystatin**: used for treatment of various mycotic infections.

C- Topical antiviral agents:-

- Acyclovir (Zovirax) and penciclovir (Denavir) are the only topical antiviral drugs currently available. These drugs inhibit viral replication.
- **Acyclovir** : is used in the treatment of initial episodes of genital herpes, as well as herpes simplex virus infections in **immune-compromised** patients (patients with an immune system incapable of fighting infection).
- **Penciclovir** : is used for the treatment of recurrent *herpes labialis* (cold sores).

- **Keratolytics:** The agents that induce sloughing of cornified epithelium (horny or hard layer of the skin). They used to remove warts and corns. They are also used in the treatment of severe acne.

N. B. when the keratolytic agent has a mild sloughing and softening effect, it termed by **Keratoplastic**, the Keratoplastic agent is used in treatment of acne, eczema, psoriasis, and seborrheic dermatitis.

- **Coal tar (chemical name).** This agent is used as a keratoplastic in the treatment of eczema, psoriasis, and seborrheic dermatitis.
 - **Salicylic acid (chemical name).** It is used as a keratolytic when present in concentrations of from 5% to 20%. It is used as a keratoplastic when present in concentrations of from 1% to 2%.
 - **Sulfur (chemical name).** Sulfur is used as a keratoplastic in the treatment of acne and seborrheic dermatitis.
 - **Diclofeniac:** also used as keratolytic agent.
- **Antiseborrheics:** are used in the management of seborrheic dermatitis. Seborrheic dermatitis is characterized by a yellowish and greasy scaling of the scalp and/or mid- parts of the face (around eyebrows and nose) and ears. Examples: chloroxine and selenium sulfide.
- **Astringents:** An astringent is an agent that dries mucous secretions, shrinks skin, and causes blanching (whitening). Astringents are used to reduce inflammation of mucous membranes, to promote healing, and to toughen skin.
- **Aluminum acetate tablets (Domeboro®. Burow's solution).**
 - When these tablets are added to water, aluminum acetate solution is prepared.
 - This product is used as an astringent for inflammatory skin conditions such as insect bites, poison ivy, and athlete's foot.
 - The patient receiving these tablets should be warned that they are for external use only.

- **Calamine lotion (calamine and zinc oxide lotion).**

- This product is used as an astringent and as a protectant (used to cover and protect epithelial surfaces).
- Calamine is a very beneficial agent in reducing inflammation associated with insect bites, poison ivy, and sunburn.
- The patient receiving this product should be told that the preparation is for external use only and that he should shake the product well before using it.

➤ **Ectoparasiticides:** an agent that applied to the host in order to get rid from the ectoparsites like lice, flies, ticks and scabies.

- **Permethrin**

- For the treatment of scabies, it is toxic to *Pediculus Spp.* and *Sarcoptes scabiei*.
- Adverse reactions to permethrin include transient burning, stinging, and Cross-sensitization to pyrethrins may occur.
- Residual drug persists up to 10 days following application.

Lindane:

- Lindane is available as a shampoo or lotion, for pediculosis and as scabicide.
- Concerns about neurotoxicity and hematotoxicity have resulted in warnings that lindane should be used with precautions.

Sulfur:

- Has a long history of use as a scabicide.
- Although it is nonirritating, it has an unpleasant odor, is staining, and is thus disagreeable to use, but it remains a possible alternative drug for use in infants and in pregnancy case. The usual formulation is 5% precipitated sulfur in petrolatum.

Malathion:

- It is an organophosphate cholinesterase inhibitor that is hydrolyzed by plasma carboxylesterases much faster in human and animals than in insects.
- It's used for remove nits, lice, ticks and flies.