Antifungal

- These are the drugs used for superficial and deep (systemic) fungal infections.
- Infectious diseases caused by fungi are called mycosis.
- Fungal infection occurs due to-
  1) Used of broad spectrum antibiotics
  2) Decreased in patient immunity

Antifungal

- Commonly used antifungal drugs are:

1. Antibiotics:
   Amphotericin B, Griseofulvin, Nystatin
2. Azoles
   - Ketoconazole
   - Clotrimazole
   - Miconazole
   - Fluconazole
   - Itraconazole
3. antimetabolites- Flucytosine
4. Allylamine- terbinafine

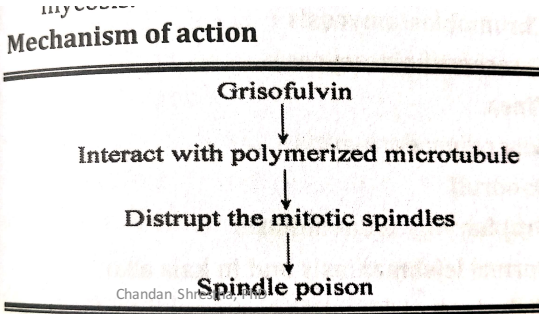
Based on MAO

1. Fungal cell wall synthesis inhibition: Caspofungin.
2. Bind to fungal cell membrane ergosterol: Amphotercin–B, Nystatin.
3. Inhibition of ergosterol + lanosterol synthesis: Terbinafine, Naftifine, Butenafine.
4. Inhibition of ergosterol synthesis: Azoles
5. Inhibition of nucleic acid synthesis: 5–Flucytosine.
6. Disruption of mitotic spindle and inhibition of fungal mitosis: Griseofulvin.
7. Miscellaneous:
   - Ciclopirox, Tolnaftate, Haloprogin, Undecylenic acid, Topical azoles.

Griseofulvin

- Extracted from *Penicillium griseofulvin*.
- Active against most dermatophytes including *Epidermophyton, Trichophyton, Microsporum*, etc.

MoA: it stops the growth of fungi. It inhibit fungal mitosis by interfering with microtubule function (disruption of the mitotic spindle)



Griseofulvin

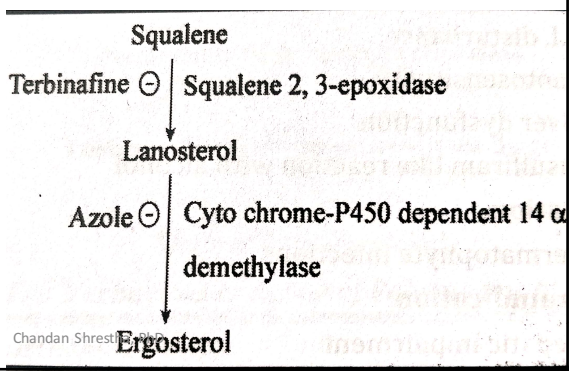
Indications: Dermatophytosis, Tinea infections, atheletes foot, etc.

A/E: headache, GIT disturbances, CNS symptoms, rashes, photoallergy, etc.

Dose: 125-250 mg QID.

Azole

- These are presently the most extensively used antifungal drugs.
- **MOA**: It inhibits synthesis of fungal sterols (ergosterol from lanosterol by inhibiting the enzyme cytochrome P450 14α-demethylase) which are a part of fungal cell wall.
- Its action is fungistatic at low dose and fungicidal at high dose.



Ketoconazole

Broad spectrum fungicide.

Uses: candidisis, histoplasmosis, blastomycosis etc. A shampoo containing 2% ketoconazole is applied twice for two to four weeks at least 3 days between each sampoo.

A/E: GI upset, rashes, pruritus, menstrual irregularities, gynaecomastia, etc.

Dose: 200-400 mg OD.

Fluconazole

Wider range of activity than ketoconazole.

Indications: UTI, cyrpotococcal meningitis, systemic and mucosal candidiasis, oropharyngeal and oesophageal infection, coccidoidal meningitis and histoplasmosis.

A/E: nausea, vomiting, abdominal pain, rash and headache.

Interactions: affects hepatic drug metabolism, increased plasm level of phenytoin, astemizole, cisapride, cyclosporine, warfarin, etc.

Dose: 150 mg oral, 200 mg/100 ml IV infusion, 0.3% eye drop.

Cotrimazole

Broad spectrum, for topical and vaginal use, active against yeasts and dermatophytes.

MoA: alters the permeability of fungal cell wall through inhibition of ergosterol synthesis which is a part of fungal cell wall.

Uses: vaginal candidiasis, trichomal vaginitis, tinea infection, athelete's foot, otomycosis, oral and cutaneous candidiasis.

A/E: local burning or stinging, skin irritation, rash, hypersensitivity reactions.

C/I: hypersensitivity, 1st trimester of pregnancy.

Preparation: vaginal cream, pessaries, ointment, lotion, powder.

Antiviral drug

- To treat viral infections
- Virus are non cellular infective organisms whose nucleic acid contain either DNA or RNA enclosed in a protein coat or capsid.

Types of antiviral drugs

1. Anti-herpes virus: acyclovir, Idoxuridine
2. Anti-retro virus:
   - ✓ Nucleoside analogs: zidovudine, lamivudine,
   - ✓ Protease inhibitors: saquinavir, ritonavir
   - ✓ Non nucleoside reverse transcritpase inhibitors: nevirapine, delavirdine
3. Anti-influenza: amantadine, rimantadine
4. Non-selective anti viral: ribavirin, interoferon alpha.

Acyclovir

- Active against herpes group of virus.

MAO: acyclovir is selectively taken up by the virus infected cells and activated to acyclovir triphosphate which inbihit DNA synthesis and viral DNA replication.

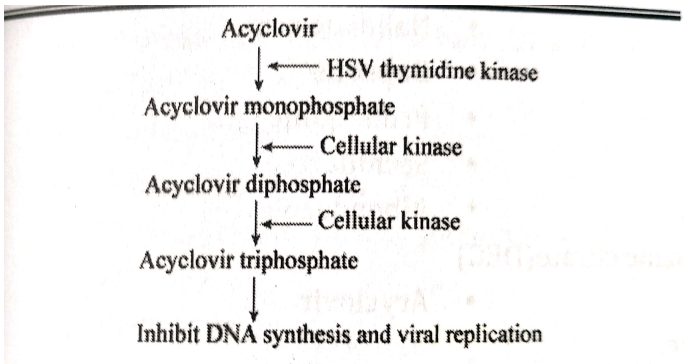


Fig: Mechanism of action of acyclovir

Chandan Shrestha, PhD

Indications

Herpes Simplex Virus Infections: general, mucocutaneous, encephalitis, keratitis, chicken pox, herpes zoster, etc.

Adverse effects

Nausea, diarrhea, rashes, sweating, emesis when given IV, headache, renal insufficiency, neurotoxicity, etc.

Doses

200-800 mg tab five hourly for five days, 250 mg/vial for IV, 5% skin cream, 3% eye drop.

Chandan Shrestha, PhD

Hepatoxic Medications

NSAIDs

Antifungal: Fluconazole, Ketoconazole

Antiepileptic: Phenytoin, valproic acid, carbamazepine

Antidepressant: TCA, SSRIs

Nephrotoxic drugs

- Antibiotics: Aminoglycosides, cephalosporin, Metronidazole, Fluoroquinolones
- Antifungal
- Antiviral
- Anticoagulant: heparin
- Opoids: morphine, codeine
- Anticonvulsants, gabapentin
- OHA: Metformin
- Others: methotrexate, allopurinol, colchicine