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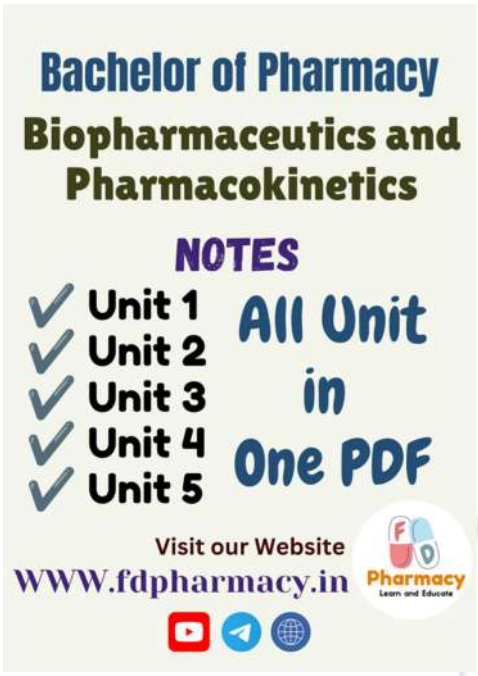
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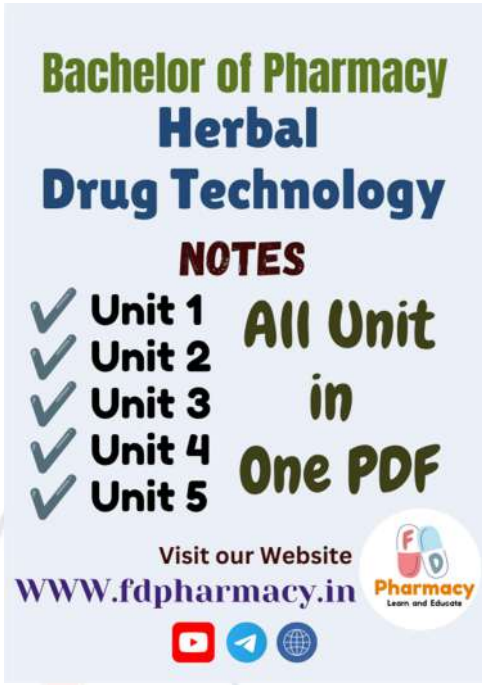
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PHARMACOLOGY - III

UNIT 3

TOPIC :

- c. Antifungal agents

Antifungal Agents

→ Antifungal agents are the drugs used for the prevention and treatment of fungal infections caused by pathogenic fungi.
→ These drugs either kill fungi (fungicidal action) or inhibit their growth (fungistatic action).

Introduction to Fungal Infections

Fungal infections are called **mycoses**.

They may affect:

- Skin
- Hair
- Nails
- Mucous membranes
- Internal organs

Types of Fungal Infections

1. Superficial Fungal Infections

- Affect skin, hair, and nails.

Examples

- Ringworm
- Athlete's foot
- Candidiasis

2. Systemic Fungal Infections

- Affect internal organs.

Examples

- Histoplasmosis
- Aspergillosis
- Cryptococcosis

Classification of Antifungal Agents

1. Polyene Antibiotics

Examples

- Amphotericin B
- Nystatin

2. Azoles

a) Imidazoles

- Clotrimazole
- Miconazole
- Ketoconazole

b) Triazoles

- Fluconazole
- Itraconazole
- Voriconazole

3. Echinocandins

Examples

- Caspofungin
- Micafungin

4. Allylamines

Examples

- Terbinafine
- Naftifine

5. Antimetabolites

Example

- Flucytosine

6. Miscellaneous Drugs

- Griseofulvin

Antifungal Drugs

1. Amphotericin B

→ Amphotericin B is a polyene antifungal antibiotic used mainly for severe systemic fungal infections.

Mechanism of Action

→ It binds to ergosterol in fungal cell membrane and forms pores.

→ This causes:

- Leakage of cell contents
- Fungal cell death

Uses

- Systemic fungal infections
- Cryptococcal meningitis
- Aspergillosis

Adverse Effects

- Fever
- Chills
- Nephrotoxicity
- Anemia

2. Nystatin

→ Nystatin is a polyene antifungal used mainly for superficial Candida infections.

Mechanism of Action

- Binds to ergosterol and damages fungal cell membrane.

Uses

- Oral candidiasis
- Vaginal candidiasis
- Skin fungal infections

Adverse Effects

- Nausea
- Skin irritation

3. Azoles

→ Azoles are antifungal drugs that inhibit fungal ergosterol synthesis.

Mechanism of Action

They inhibit fungal enzyme:

- 14-α demethylase

This decreases ergosterol synthesis and damages fungal cell membrane.

Important Azoles

a) Clotrimazole

Uses

- Ringworm
- Athlete's foot
- Vaginal candidiasis

b) Ketoconazole

Uses

- Fungal skin infections

Adverse Effects

- Hepatotoxicity
- Endocrine disturbances

c) Fluconazole

Uses

- Candidiasis
- Cryptococcal meningitis

Advantages

- Good oral absorption
- Good CSF penetration

d) Itraconazole

Uses

- Histoplasmosis
- Aspergillosis

4. Echinocandins

→ Echinocandins are antifungal drugs that inhibit fungal cell wall synthesis.

Examples

- Caspofungin
- Micafungin

Mechanism of Action

Inhibit synthesis of:

- β-(1,3)-D-glucan

This weakens fungal cell wall.

Uses

- Invasive candidiasis
- Aspergillosis

Adverse Effects

- Fever
- Rash
- Liver toxicity

5. Terbinafine

→ Terbinafine is an allylamine antifungal mainly used for dermatophyte infections.

Mechanism of Action

Inhibits:

- Squalene epoxidase enzyme

This blocks ergosterol synthesis.

Uses

- Nail fungal infections
- Ringworm

Adverse Effects

- Headache
- GI disturbances
- Hepatotoxicity