

UNIT-5

MYCOLOGY

Medically Important fungal Diseases

1. **Fungus allergies** (Hypersensitivity)- an allergic reaction to molds and spores rhinitis, conjunctivitis, throat- and laryngeal oedema, bronchial asthma, alveolitis, generalized pneumonia
2. **Mycotoxicoses** - poisoning of man and animals by feeds and food products contaminated by fungi which produce toxins from the grain substrate
3. **Mycetismus**- the ingestion of preformed toxin (mushroom poisoning).
4. **Infection (Mycoses)**- acute-, subacute - or chronic inflammation localized or generalized infection

Predisposing factors for fungal disease

1. Increased moisture

- creates a more hospitable environment for proliferation of pathogens fungus.
- Use absorbent powders and cloths made of fabrics that allow evaporation to keep surface dry to prevent the disease.

2. Obesity

- Obesity promotes accumulation of surface moisture in body folds

3. Invasive procedures

- It disrupts the physical integrity of the skin.
- To prevent the disease, always follow aseptic technique

4. Wounds

- Exposes the underlying tissue to environment that facilitates their development of skin infection.
- Disease can be prevented by practicing good hygiene and sanitary habit to prevent wound colonization

5. Tight clothing

- It also disrupts the physical integrity of skin through continual abrasion.

6. Underlying debilitating disease

- Cause malfunction of the immune system
- Decrease phagocytic function.

e.g., Diabetics

- Impairs granulocyte function

HIV infection

- Defect in cells of the immune system lead to partial or complete loss of immunity

7. Prolonged administration of corticosteroids or antibiotic or chemotherapy

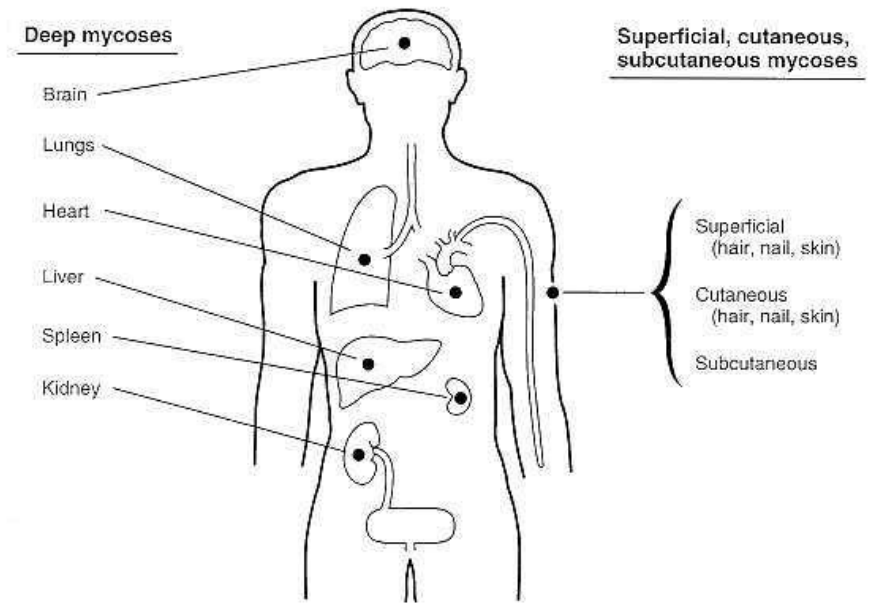
Mycoses

- Dermatomycoses

- Superficial mycoses
- Cutaneous mycoses
- Subcutaneous mycoses

- Systemic mycoses

- Primarily systemic mycoses
- Opportunistic mycoses



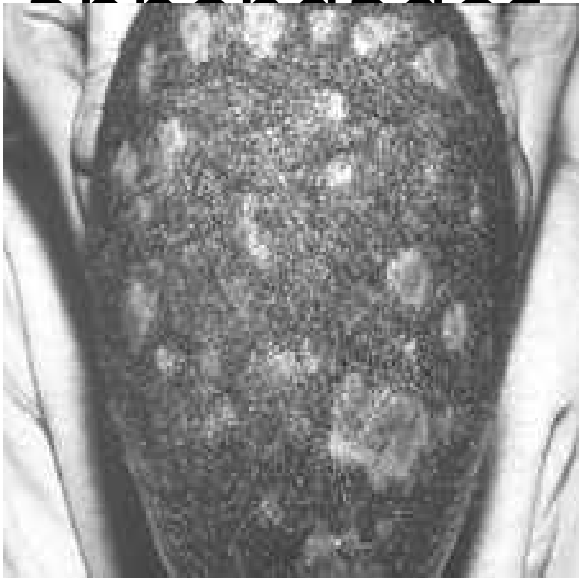
Dermatomycoses

A. Superficial mycoses

- Pityriasis versicolor--pigmented lesions on torso
- Tinea nigra--gray to black macular lesions often on palms
- Black piedra--dark gritty deposits on hair
- White piedra--soft whitish granules along hair shaft
- All are diagnosed by microscopy and are easily treated by topical preparations.

B. Cutaneous Mycoses

- Three genera of dermatophytes,
 - *Microsporum*,
 - *Trichophyton*,
 - *Epidermophyton*
- Cause infections of skin and its appendages



Clinical Name	Site	Most frequent organism
Tinea capitis (epidemic)	scalp	<i>Trichophyton tonsorius</i> , <i>Microsporum audouinii</i>
Tinea capitis (non-epidemic)	scalp	<i>Microsporum canis</i> , <i>Trichophyton verrucosum</i>
Tinea favosa	scalp, torso	<i>Trichophyton sp.</i>
Tinea barbae	beard	<i>Trichophyton rubrum</i> , <i>T. verrucosum</i>
Tinea corporis	arms, legs torso	<i>T. rubrum</i> , <i>M. canis</i> , <i>T. mentagrophytes</i>
Tinea cruris	crotch	<i>T. rubrum</i> , <i>T. mentagrophytes</i> , <i>Epidermophyton floccosum</i>
Tinea pedis, manus	feet hands	<i>T. rubrum</i> , <i>T. mentagrophytes</i>
Tinea unguium	nails	<i>T. rubrum</i> , <i>T. mentagrophytes</i> , <i>E. floccosum</i>
Tinea imbricata	torso	<i>T. concentricum</i>

C. Subcutaneous mycoses common characteristics

- Introduced through skin by foreign body
- Disease; usually local
 - Primarily involve the dermis and subcutaneous tissue
 - May disseminate to adjacent bones, joints. spread via lymphatics
- The causative fungal agents are commonly found in the soil or on decaying organic material
- Most common in non industrialized world

Main subcutaneous mycoses

- Sporotrichosis
- Chromoblastomycosis
- Mycetoma



1. Sporotrichosis :

- Ulcerated lesions at site of inoculation followed by multiple nodules -
- Caused by a dimorphic fungus: [Sporotrix schenckii](#).

2. Chromoblastomycosis:

- Posttraumatic chronic inf. of subcutaneous tissue
- Papules → verrucous cauliflower-like lesions on lower extremities
- Results in disfigurement of the affected body sites
- Prominent features include epithelial hyperplasia
- Fibrosis and microabscess formation in the epidermis
- Systemic invasion is very rare



3. Mycetoma : (Maduromycosis, Madura foot)

- Posttraumatic chronic infection of subcutaneous tissue
- Characterized by draining sinuses, granules and tumefaction
- usually involves the cutaneous and subcutaneous tissue, fascia and bone of the foot or hand
- Common in tropical climates
- Causative agents
 - Saprophytic fungi (Eumycetoma)
 - Actinomyces* (Actinomycetoma)

MYCETOMA cont'd

Clinical findings

Site(s): Feet, lower extremities, hands

Findings: Abscess formation, draining sinuses containing Granules, Deformities

Dissemination: Muscles and bones



Diagnosis

- Direct Microscopy of serosanguinous fluid containing the granules
 - Either 10% KOH and Parker ink or calcofluor white mounts

5.2. TRUE SYSTEMIC (ENDEMIC) MYCOSES

- Coccidioidomycosis
- Histoplasmosis
- Blastomycosis
- Paracoccidioidomycosis
- Penicilliosis

Systemic mycoses cont'd

- Inherently virulent and can cause disease in healthy humans
- Geographic distribution varies
- Inhalation → pulmonary inf. → dissemination
- No evidence of transmission among humans or animals
- Causative agents: thermally dimorphic fungi that exist in nature, soil
- Most infections are asymptomatic or self-limiting
- In immune-compromised hosts, infections are more often fatal

Opportunistic Mycoses

- Fungal infections that do not normally cause disease in healthy people
- But do cause disease in people with weakened immune defenses (immunocompromised people).
 - Inherited immunodeficiency diseases
 - Drugs that suppress the immune system (cancer chemotherapy, corticosteroids, drugs to prevent organ transplant rejection),
 - Radiation therapy
 - infections (e.g., HIV)
 - cancer, diabetes, advanced age and malnutrition

The most common opportunistic infections are

- Aspergillosis
- Candidiasis
- Cryptococcosis
- *Pneumocystis carinii*
- Zygomycosis