

Lecture 9: Superficial, Cutaneous, and Subcutaneous Mycoses

Superficial Mycoses

- ◆ Include the following disease classifications:
 - * Superficial
 - * Dermatophytoses
 - * Cutaneous infections caused by non-dermatophytic fungi
 - * Cutaneous candidiasis
- ◆ Superficial Infections
 - * Defined as fungal infections of the skin and hair that invade only the most superficial layers and cause little or no inflammatory response
 - * Four general types
 - Malasseziosis - *Malassezia* species
 - ✦ Also known as pityriasis (tinea) versicolor
 - ✦ Hypo- to hyperpigmented patches with scales
 - ✦ Can also cause folliculitis
 - ✦ These fungi also cause seborrheic dermatitis and dandruff
 - ✦ Diagnosis - “spaghetti and meatballs” appearance of oval to round budding yeasts as well as short, septate and sometimes branching hyphae
 - ✦ Treatment - selenium sulfide or ketoconazole shampoos, systemic or topically applied azoles (ketoconazole or itraconazole), terfenadine
 - Tinea nigra - *Exophiala werneckii*
 - ✦ Asymptomatic, non-scaly brown to gray patches on palms or soles of feet
 - ✦ Confirmed by KOH prep of skin sample showing pigmented hyphae
 - Black piedra - *Piedraia hortae*
 - ✦ Superficial infection of hair shafts
 - ✦ Causes shafts to break
 - White piedra - *Trichosporon* species
 - ✦ Superficial infection of hair shafts
 - ✦ Diagnosis - observation of hyphae and arthroconidia

◆ Dermatophytoses

- * Infections commonly referred to as “tineas”
- * Caused by three different species
 - *Trichophyton*
 - *Microsporum*
 - *Epidermophyton*
- * Epidemiology
 - Arthropophilic - acquired from other humans
 - Geophilic - acquired from soil
 - Zoophilic - acquired from animals
- * Diagnosis
 - Microscopic observation of fungal elements in skin samples/scrapings prepared in KOH
 - Culture of fungus
 - ✦ Microscopic identification
 - ✦ Growth on diagnostic media
- * Pathogenesis
 - Virulence related to secreted keratinases
 - Cell-wall mannans are immunoinhibitory
 - Human genetics may play a role in making some families more susceptible to some fungi
- * Types of tineas
 - Corporis - body
 - Cruris - inguinal, pubic, and perianal areas; also known as “jock itch”
 - Pedis/manuum - feet or toes webs; also known as “athlete’s foot”
 - Unguium - fingernails or toenails
 - Capitis - hair follicles; also known as “ringworm of the scalp”
- * Treatment of tinea types
 - Corporis - topical allylamines and azoles
 - Cruris - most topical agents, but griseofulvin for severe, unresponsive cases
 - Unguium - systemically applied doses of fluconazole, itraconazole, or terbinafine
 - Capitis - systemically applied doses of griseofulvin, fluconazole, itraconazole, or terbinafine

- ◆ Non-dermatophytic infections
 - * Defined as non-dermatophytes (i.e., not *Epidermophyton*, *Trichophyton*, or *Microsporum* species) that invade keratinized tissue and produce infections that clinically resemble dermatophytosis
 - * Main etiological agents: species of *Scytalidium* and *Scopulariopsis*
 - * Treatment: topical and systemic drugs generally not effective
- ◆ Superficial candidiasis
 - * Defined as an infection of the cutaneous or mucosal epithelium by *Candida* species
 - * Types of infections:
 - Cutaneous - onychomycosis, intertrigo, and interdigitalis blastomycetia
 - Superficial - oropharyngeal, vaginal, balantia, chronic mucocutaneous
 - * Treatment: in most cases, good response to topical or systemic antifungals

Eumycetoma

- ◆ Mycetoma is a chronic, subcutaneous infection that can spread to bone and lymph tissue
- ◆ Three characteristics of mycetomas
 - * Tumor - progressive, relatively painless swelling of tissue
 - * Draining sinuses
 - * Grains (colonies) formed and released
- ◆ Etiologic agents
 - * Aerobic actinomycetes (bacteria)
 - * Various fungal agents (eumycetoma)
 - Black grain mycetoma
 - ✦ *Madurella mycetomatis*
 - ✦ *Madurella grisea*
 - ✦ *Scedosporium apiospermum*
 - ✦ *Leptosphaeria senegalensis*
 - White grain mycetoma
- ◆ Pathogenesis - disease develops typically as a result of a minor trauma that implants the etiological agent; subsequently, the host response limits hyphal growth and instead promotes grain production
- ◆ Treatment
 - * Surgery
 - * Extended antifungal use

Chromoblastomycosis

- ◆ Defined as a chronic fungal infection of the skin and subcutaneous tissue
 - * Fungal agents are darkly pigmented
 - * Histopathologically produce sclerotic cells in vivo
 - * Lesions are nodular and verrucous
- ◆ World wide distribution, but tends to subtropical to tropical
- ◆ Infections tend to be of the lower extremities
- ◆ Means of infection almost exclusively a result of traumatic implantation
- ◆ Causative agents (selected):
 - * *Fonsecea pedrosoi* and *F. compacta*
 - * *Phialophora verrucosa*
 - * *Cladophialophora species*
- ◆ Disease often confused with phaeohyphomycosis due to some similar/common pathogens - remember: the disease is primarily defined on in vivo pathology
 - * Phaeohyphomycosis - yeast and hyphae
 - * Chromoblastomycosis - sclerotic cells
- ◆ Treatment is difficult
 - * Surgical intervention
 - Best for small lesions
 - Often combined with antifungals in severe cases
 - * Antifungals alone have been minimally successful