Medical mycology (L.2) **D.Hamzia Ali**

Classification of diseases cause by fungi

Mycoses are classified according to the levels initially colonized.

1-Superficial mycoses

Superficial mycoses are limited to the outermost layers of the skin and hair(epidermis) .

2-Cutaneous mycoses

Cutaneous mycoses extend deeper into the epidermis , and also include invasive hair and nail diseases. These diseases are restricted to the keratinized layers of the skin, hair, and nails.

3-Subcutaneous mycoses.

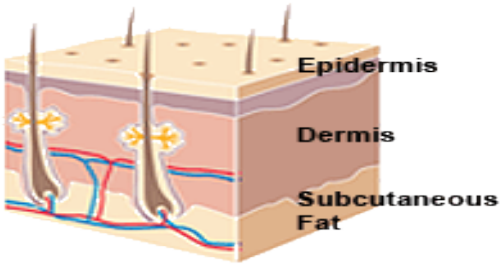
Subcutaneous mycoses involve the dermis, subcutaneous tissues, muscle and fascia.

4-Systemic mycoses due to primary pathogens.

Systemic mycoses due to primary pathogens originate primarily in the lungs and may spread to many organ systems.

5-Systemic mycoses due to opportunistic pathogens.

Systemic mycoses due to opportunistic pathogens are infections of patients with immune deficiencies who would otherwise not be infected.



Epidermis is divided into the following 5 sublayers or strata:

Stratum corneum,Stratum lucidum, Stratum granulosum, Stratum spinosum and Stratum germinativum (also called "stratum basale").

Superficial Mycoses

These are superficial fungal infections of the skin or hair shaft. No living tissue is invaded and there is no cellular response from the host. Essentially no pathological changes are elicited.

1- ***Malassezia*** **infections**

Definition

Malassezia infections (Malassezioses or pityrosporoses) are common conditions without serious nature, characterized by their frequent recurrences. They are due to commensal yeast Malassezia genus

Pathogens

Malassezia yeasts are known long been known in human pathology. The best known, *Malassezia furfur*, is the main species responsible for *pityriasis* versicolor.

Epidemiology

Skin commensal yeast, Malassezia proliferate in the epidermis producing mycelium under the influence of various factors specific to the host:
- Oily (high content of triglycerides and free fatty acids) or application of fatty substances on the skin (solar oils).
- Heat, humidity, sweating (*pityriasis versicolor* frequency in tropical regions).
- Pregnancy.
- Immunosuppression.

There is probably a genetic predisposition. The malassezioses are not contagious

Clinical manifestations

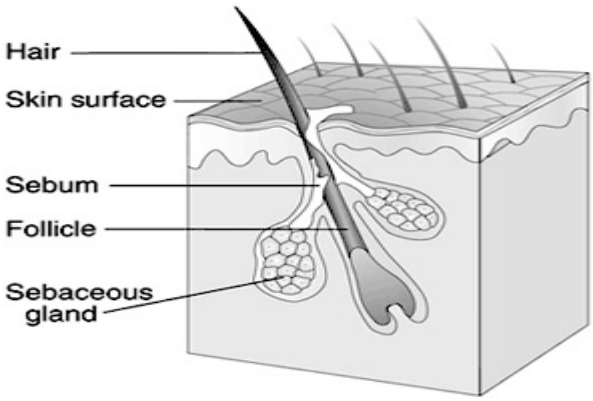
a-Pityriasis versicolor:

This is a chronic, superficial fungal disease of the skin characterised by white, pink, or brownish lesions, often covered with thin furfuraceous scales. The colour varies according to the normal pigmentation of the patient, exposure of the area to sunlight, and the severity of the disease the term versicolor [definition: may colored].


Pityriasis versicolor

b- Seborrheic dermatitis

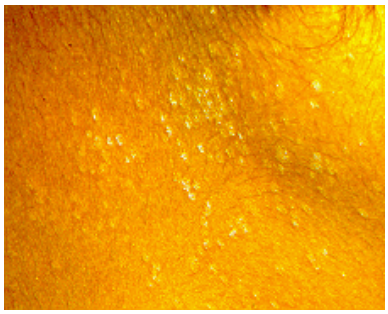
Seborrhoeic dermatitis is a common, harmless, itchy, red skin and scaling rash affecting the face, scalp and other areas.. It particularly affects the -gland-rich areas of skin (.Sebaceous glands secrete the oily, waxy substance called *sebum*.



Acute form of seborrhoeic dermatitis on scalp

c- Pityriasis capitis(Dandruff)
It is the dandruff of the scalp. Often favored by stress, seborrhea. Itching is common and can cause hair loss .**Dandruff** (also called 'pityriasis capitis') is an uninflamed form of seborrhoeic dermatitis. Dandruff presents as scaly patches scattered within hair-bearing areas of the scalp.

d-Malassezia folliculitis
It is a skin disease especially prevalent in young men. Itching is normal. The usual seat is the back with a possible association of the front of the chest.



Pityriasis folliculitis

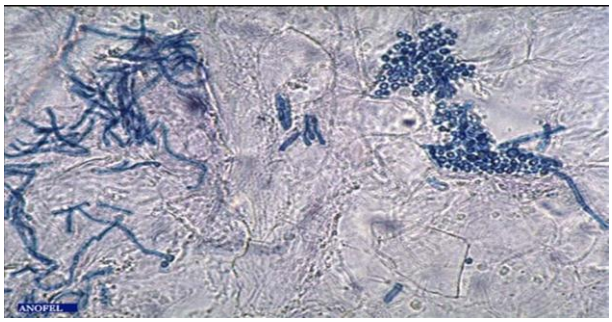
d-The fungemia Malassezia

They are rare and occur in premature infants or immunocompromised fed by intravenously.

Laboratory diagnosis:

1. Clinical material: Skin scrapings from patients with superficial lesions, blood and indwelling catheter tips from patients with suspected fungaemia.

2. Direct Microscopy: Skin scrapings taken from patients with Pityriasis versicolor stain rapidly when mounted in 10% KOH, glycerol and Parker ink solution and show characteristic clusters of thick-walled round, budding yeast-like cells and short angular hyphal forms up to 8um in diameter (ave. 4um diam.).



3. Culture: Culture is only necessary in cases of suspected fungaemia. *M. furfur* is a lipophilic yeast, therefore in vitro growth must be stimulated by natural oils or other fatty substances. The most common method used is to overlay Sabouraud's dextrose agar containing cycloheximide (actidione) with olive oil or alternatively to use a more specialized media like Dixon's agar which contains glycerol mono-oleate (a suitable substrate for growth)..

4. Serology: There are currently no commercially available serological procedures for the diagnosis of *Malassezia* infections.

Treatment 1-use a topical imidazole in a solution.

2- Ketoconazole shampoo has proven to be very effective.

3-In severe cases with extensive lesions, or in cases with lesions resistant to topical treatment ,oral therapy with either or itraconazole

2-Tinea nigra

World-wide distribution, but more common in tropical regions of Central and South America, Africa, South-East Asia and Australia. The aetiological agent is *Exophiala werneckii* or *Hortaea (Phaeoannellomyces) werneckii* a common saprophytic fungus believed to occur in soil, compost, and on wood in humid tropical and sub-tropical regions.

Clinical manifestations:

Skin lesions are characterised by brown to black macules which usually occur on the palmar aspects of hands and occasionally the plantar and other surfaces of the skin. Lesions are non-inflammatory and non-scaling..

Laboratory diagnosis:

1. Clinical Material: Skin scrapings.

2. Direct Microscopy: Skin scrapings should be examined using 10% KOH and Parker ink or calcofluor white mounts.
3. Culture: Clinical specimens should be inoculated onto primary isolation media, like Sabouraud's dextrose agar.

4. Serology: Not required for diagnosis.

Treatment :whitfild ointment , topical imidazole in a solution

3-Black piedra

Black piedra is a superficial fungal infection of the hair shaft caused by *Piedra hortae*, an ascomycetous .It is common in Central and South America and South-East Asia.

Clinical manifestations:

Infections are usually localised to the scalp but may also be seen on hairs of the beard, moustache and pubic hair. Black piedra mostly affects young adults and epidemics in families have been reported following the sharing of combs and hairbrushes. Infected hairs generally have a number of hard black nodules on the shaft.

Laboratory diagnosis:

1. Clinical Material: Epilated hairs with hard black nodules present on the shaft.

2. Direct Microscopy: Hairs should be examined using 10% KOH and Parker ink or calcofluor white. Look for darkly pigmented nodules that may partially or completely surround the hair shaft. Nodules are made up of a mass of pigmented with a stroma-like centre containing asci.

3. Culture: Hair fragments should be implanted onto primary isolation media, like Sabouraud's dextrose agar. Colonies of Piedra hortae are dark, brown-black and take about 2-3 weeks to appear.

4. Serology: Not required for diagnosis.

4-White piedra

White piedra is a superficial cosmetic fungal infection of the hair shaft caused by *Trichosporon* spp . White piedra is found worldwide, but is most common in tropical or subtropical regions.

Clinical manifestations:

Infections are usually localised to the axilla or scalp but may also be seen on facial hairs and sometimes pubic hair. White piedra is common in young adults. The presence of irregular, soft, white or light brown nodules, 1.0-1.5 mm in length, firmly adhering to the hairs is characteristic of white piedra.

Laboratory diagnosis:

1. Clinical Material: Epilated hairs with white soft nodules present on the shaft.

2. Direct Microscopy: Hairs should be examined using 10% KOH and Parker ink or calcofluor white mounts. Look for irregular, soft, white or light brown nodules, 1.0-1.5 mm in length, firmly adhering to the hairs.

3. Culture: Hair fragments should be implanted onto primary isolation media, like Sabouraud's dextrose agar. Colonies of *Trichosporon beigelii* are white or yellowish to deep cream colored, smooth, wrinkled, velvety, dull colonies with a mycelial fringe.

4. Serology: Not required for diagnosis.

Treatment for black and white piedra :the hair shoud be shaved , use ointment from imidazole ,selenium sulfide 2%.chlorhexidine solution