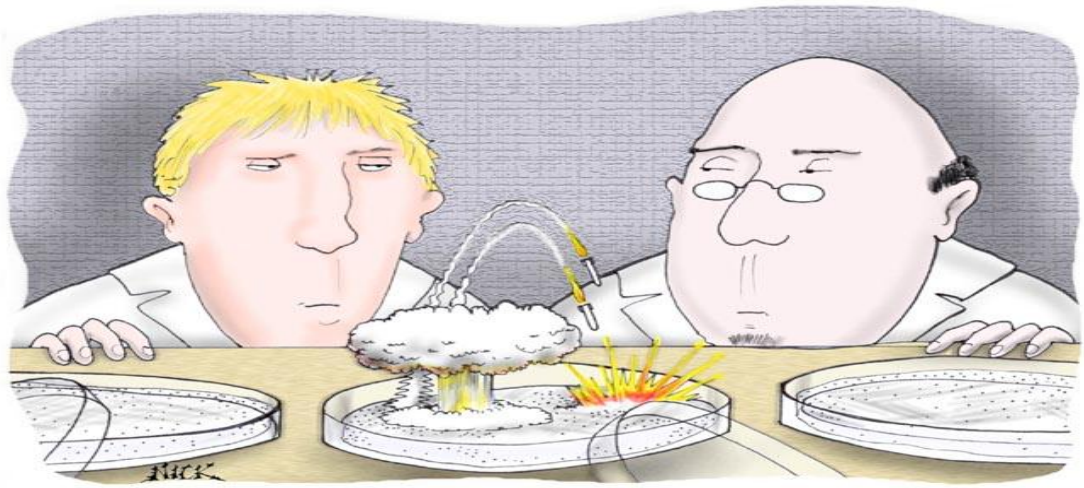
Candidiasis



Once again, war breaks out in the middle yeast.

Please check the correction link before you start studying to know if there are any changes [Correction link]

Do not hesitate to contact us on [Microbio434@gmail.com]

Introduction:

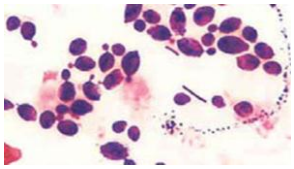
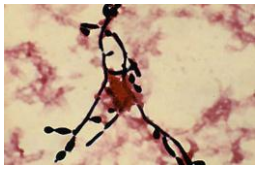
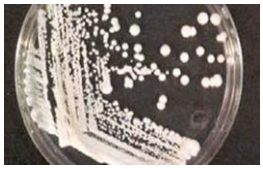
Candidais is a **unicellular**, **imperfect yeast fungus reproduced by budding**. Although many species of Cabdida are harmless, it is the **most common cause of fungal infections** worldwide. There are >150 Spps

It is human commensal and can be found in: oral cavity, skin, gastrointestinal tract and genitourinary tract.

the most common pathogenic species of Candida are:

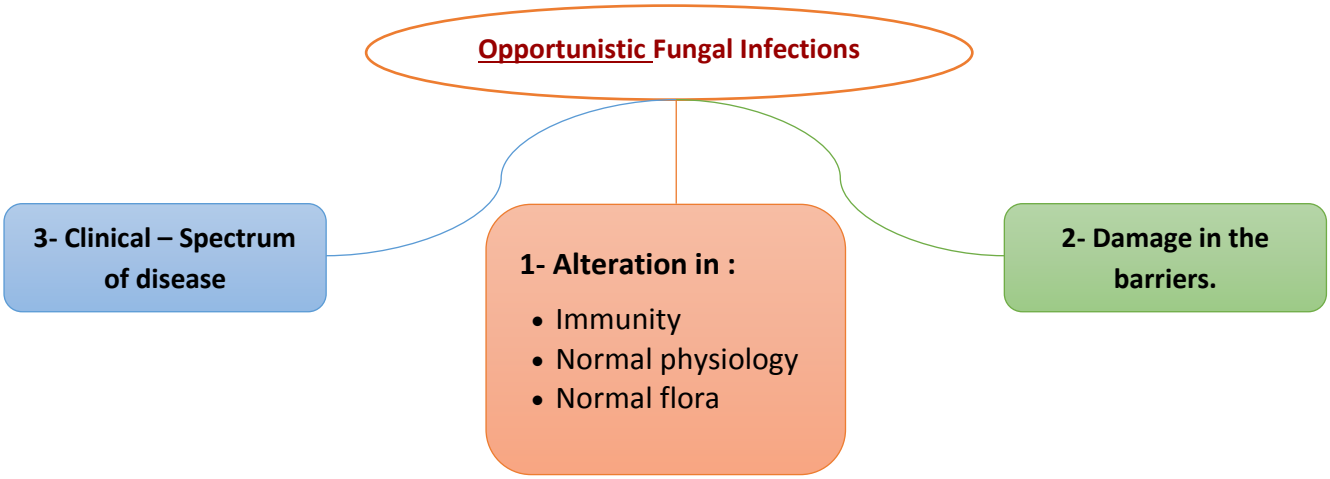
1-Candida albicans **2**-Candida parapsilosis **3**-Candida tropicalis **4**-Candida glabrata* **5**-Candida Krusei*

Note*: C. krusei & C.glabrata are **resistant to fluconazole.**

Candidiasis: Any infection caused by any species of the yeast fungus Candida.

- **The most common** invasive fungal infections in **immunocompromised** patients.
- **4th** most common cause of **nosocomial bloodstream infection.**
- It is considered **opportunistic infection**



Transmission of opportunistic infections	
Endogenous	**Exogenous**
• **Colonization precedes infection** • **Antibiotics suppress normal flora and cause fungal overgrowth.**	**can happen during hospitalization and will be transmitted by the hand.**

Clinical features

1

Mucocutaneous infections

mucous membrane

1. **Oropharyngeal Candidiasis (aka oral thrush):**
   - **White or gray pseudomembranous patches** on oral surfaces especially tongue with underlying erythema.
   - Common in neonates, infants and elderly.
   - **In immunocompromised host**, e.g. AIDS

2. **Esophagitis** "inflammation that damage the esophagus"

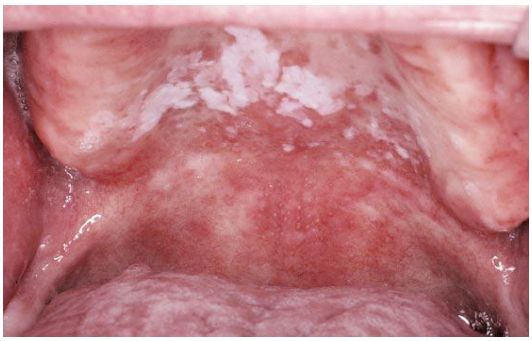
3. **Vulvovaginitis:**
   - An inflammation of the vagina that can result in thick discharge, itching and pain.
   - Common in pregnancy, diabetics and contraceptive drugs users.

2

Cutaneous infections

1. **Intertriginous candidiasis:**
   - **Infections of skin fold** "e.g. axilla, buttock, toe web, under breast …etc"
   - Erythematous lesion, dry or moist or whitish accompanied by itching and burning.
2. **Nail infection: such as onychomycosis** Nail **and paronychia** skin around nail bed.
3. **Diaper rash**: in babies.
4. **Chronic mucotaneous candidiasis** (CMC) : children with T-cell abnormality

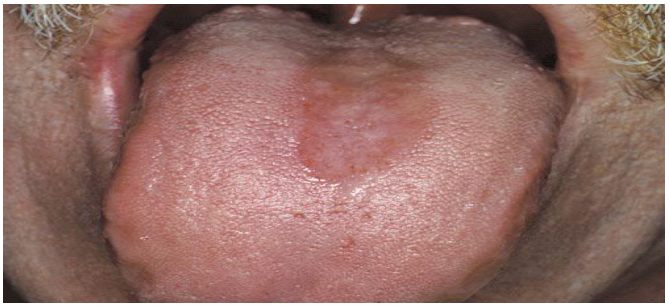
Forms of Oral candidiasis [Oral thrush]



pseudomembranous-erythematous form.

Pseudomembranous form

Erythematous form



Painful depapillation of the tongue dorsum

Painful hyperplastic candida of the lateral tongue

Chronic mucocutanuous candidiasis

Pulmonary candidiasis

- **Primary pneumonia** is less common and could be a result of aspiration.
- **Secondary pneumonia** commonly seen with hematogenous candidiasis.
- Usually, the fungal infections **associate with immunocompromised patients**.

Isolation of Candida from sputum, BAL"bronchoalveolar lavage" is not always significant	
Seen candida in sputum isn't conformation for infection ((could be NORMAL FLORA))	To confirm infection, you have to overlap the following : • Clinical features • Radiology • Other Lab investigations

Candidemia "candida in blood"

- Candida is the **fourth** in causing **nosocomial** bloodstream infections (BSI)
- **Increased colonization** "endogenous or exogenous factors'
- **Damage in host barriers** by catheters, trauma or surgery.
- **Fever could be the only clinical manifestation.**
- Immunosuppression and central venous catheters"CVC"

Disseminated candidiasis (involvement of any organ)		
Septic shock: medical condition that occurs when sepsis, **body-wide inflammatory** response to infection, leads to **dangerously low blood pressure.**	**Meningitis:** The most common symptoms of meningitis are headache and neck stiffness associated with fever, confusion or altered consciousness, vomiting, and an inability to tolerate light or loud noises	**Ocular involvement (retinitis):** is inflammation of the retina in the eye, which may lead to blindness. Retinitis may be caused by a number of different infectious agents.

Laboratory diagnosis

Specimen: it depends on the site of infection: Swabs(oral), Urine(UTI), Blood **(Candidemia),** Respiratory specimens(RTI), CSF.

Direct microscopy

- We use Gram stain or KOH to look for Budding yeast cells and pseudohyphae .
- We use silver stain, Giemsa, Gram stain, KOH, GMS, or PAS stained smears.

Culture

- Media: SDA(Sabouraud agar) & Blood agar at 37oC
- We will see Creamy moist colonies in 24 - 48 hours

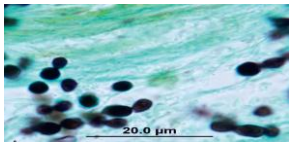
Blood culture

- We use it when we suspect septicaemia

Serology serum

- Test for antigen, e.g. mannan antigen using ELISA
- Test for antibodies.

PCR



Because *C.albicans* is the most common species to cause infection The following tests are used to identify C.albicans:

1-Germ tube test : Formation of germ tube when cultured in serum at 37°C.

2-Chlamydospore production in corn meal Agar

3-Resistance to 500 µg/ml Cycloheximide

- If these 3 are positive this yeast is *C.albicans*,
- If negative, then it could be any other yeast,

1-Use Carbohydrate assimilations and fermentation. Commercial kits available for this like: API 20C, API 32C

2-Culture on Chromogenic Media (CHROMagar™ Candida)

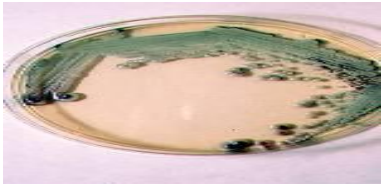
Candida albicans

Sabouraud Agar

Morphology: Creamy white yeast, may be dull, dry irregular and heaped up, glabrous and tough

Chromagar

producing green pigmented colonies on specially designed medium to speciate certain yeasts based on color they produce



Treatment

Type of candidiasis	Drugs that can be used
Oropharyngeal infection	Topical **Nystatin**, **Clotrimazole**, **Miconazole or Fluconazole**.
Vaginitis	**Miconazole, Clotrimazole or Fluconazole**
Systemic treatment of Candidiasis	**Fluconazole, Voriconazole, Caspofungin or Amphotericin B.**

Notes in treatment:

- **Candidemia:** Treat 14 days after last negative culture and resolution of signs and symptoms and remove catheter, if possible.
- **Antifungal sensitivity testing** is not done routinely in the microbiology lab like what we do with bacteria.

- It is done just in the following cases:

1- For fungi isolated from **sterile samples**

2- If the patient is **not responding** to treatment

3- In case of **recurrent** infections

Points to consider:

C. glabrata and *C. krusei* are resistant to fluconazole. We have to use other drugs to treat.

MCQs:-

1- Which of the following has drug resistance to fluconazole:
A-C.albicans B-C.tropicalis C-C.parapsilosis D-C.krusei

Ans:D

2- Which of these mucocutaneous infections is more common whith immunocompromised patient:
A-Esophagitis B-oropharyngeal C-valvuvaginitis D-intertriginous

Ans:B

3- Which infection is of skin folds:
A-diaper rash B-chronic mucocutaneous candidiasis"CMC"
C-intertriginous D-nail infections

Ans:C

4- Which agar do we use for C.albicans:
A-blood agar B-sabouraud dextrose agar C-chrom agar D-B&C

Ans:D

5- Which of the following is the best microscopic stain to indicate budding yeast cells

A-Periodic acid-schiff B-methenamine silver stain C-KOH D-SDA

Ans:B

SAQs:-

1- What is candidiasis and give one example of mucous & cutaneous infections:

Ans: it is any infection caused by any species of yeast fungus candida

mucous:thrush, esophagitis and vaginitis

cutaneous:diaper rash, CMC, onychomycosis.

2- Mention the expected complications from disseminated candidiasis infection:

A-septec shock B-meningitis C-retinitis

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