MICROBIOLOGY
TEAM 432

LECTURE (2)
(CANDIDIASIS)

OBJECTIVES:

Students at the end of the lecture will be able to:

1. Acquire the basic knowledge about Candida as a pathogen
2. know the main infections caused by Candida species
3. Identify the clinical settings of such infections
4. Know the laboratory diagnosis, and treatment of these infections.

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Very important Additional information Male doctor's notes Female doctor's notes

MIND MAP (CANDIDIASIS)

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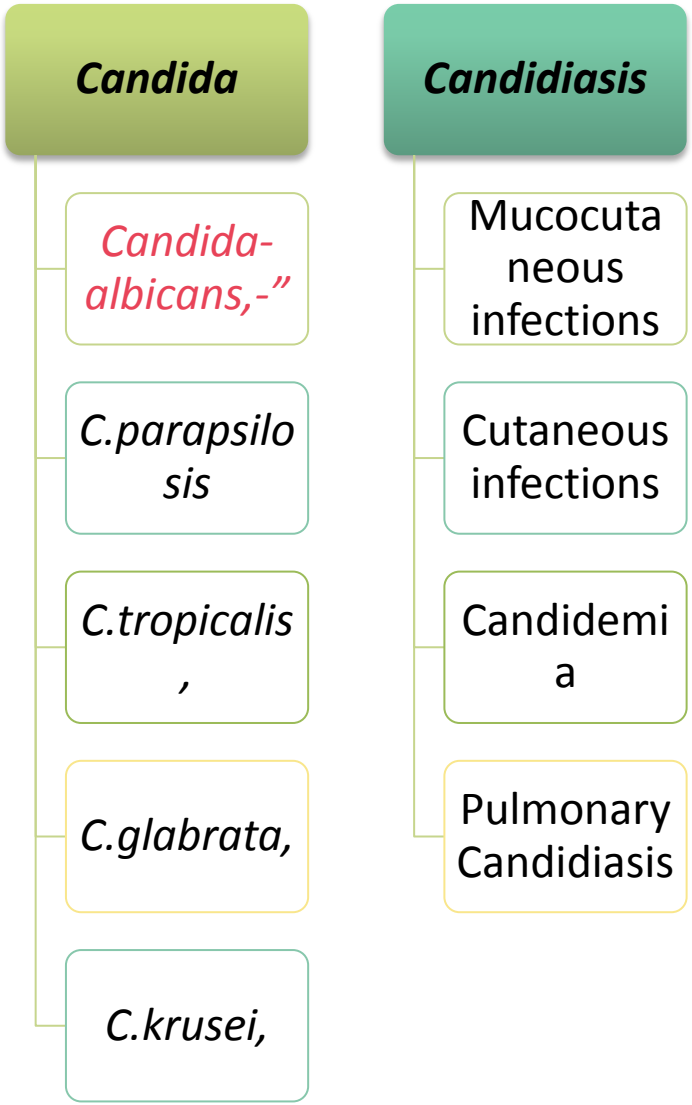
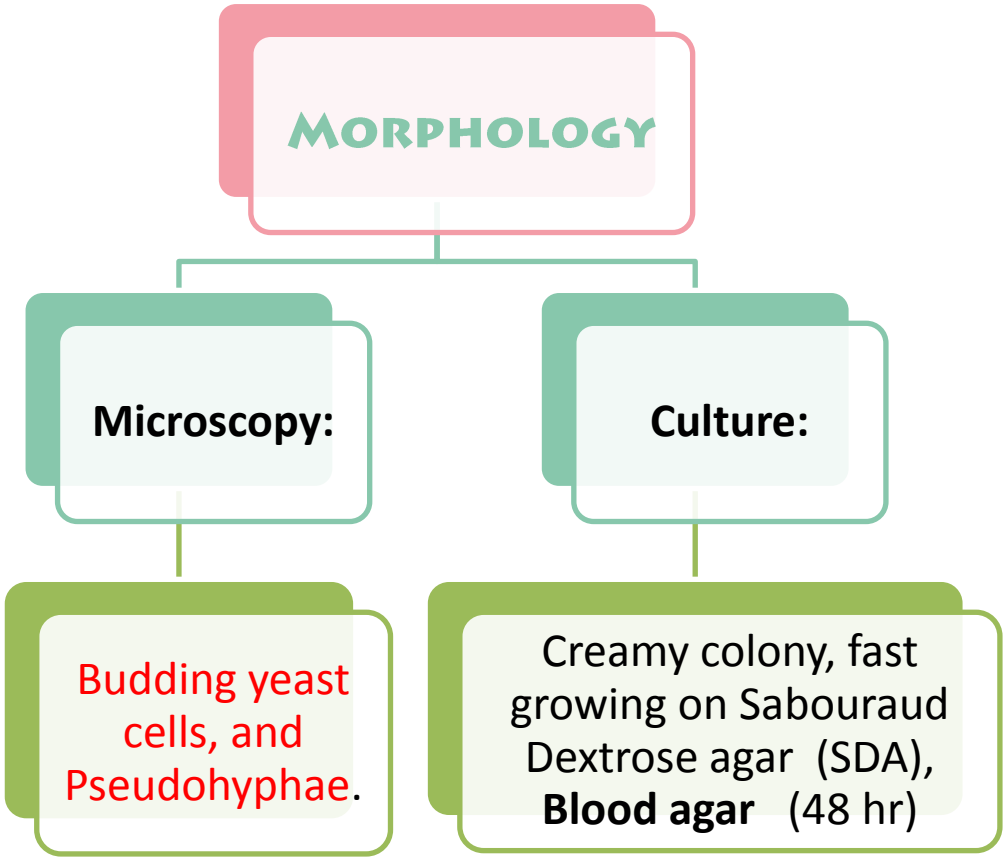


The Organism Candida

- Candida is a unicellular yeast fungus.
- It is imperfect reproducing by budding



- There are many species of Candida (>150)
- The common species are:
  - Candida-albicans,-"the commonest"
  - C.parapsilosis
  - C.tropicalis,
  - C.glabrata,
  - C.krusei,

- **Human commensal**
  - Oral cavity
  - Skin
  - Gastrointestinal tract
  - Genitourinary tracts

The disease" Candidiasis"

Definition:

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 blood stream infection causing septicemia

❖ It is considered opportunistic infection

1-Alteration in :

Immunity (cancer ,some drugs, diabetes ,infection" HIV ", genetic "SLE ")

Physiology (pregnancy , old age , infants)

Normal flora

2-Damage in the barriers catheters, trauma, surgery

3- ENDOGENOUS

Colonization precedes infection

Antibiotic suppression of normal flora, fungal overgrowth

4- Clinical – Spectrum of disease?

Candida - Clinical

Mucocutaneous infections	Cutaneous infections
➢ Oropharyngeal Candidiasis ➢ Oral thrush: "most common" very common in infant ,very old and Aids patients • White or grey Pseudomembranous patches on oral surfaces especially tongue with underlying erythema. • Common in neonates, infants, elderly • In immunocompromised host, e.g. AIDS. ➢ Esophagitis ➢ Vulvovaginitis : "common" • Common in pregnancy, diabetics, use of contraceptives. • Thick discharge, itching irritation . Lesion appear as white patches on vaginal mucosa.	➢Intertriginous candidiasis: Infections of skin folds eg. axilla, buttock, toe web, under breast. Erythematous lesion, dry or moist or whitish accompanied by itching and burning. ➢Nail infections: Onychomycosis (nails) and paronychia(skin around nail bed) ➢Balanitis ➢ Diaper rash ➢ Chronic mucocutaneous candidiasis "CMC" children with T-cell abnormality

Cont.Candida - Clinical

- Urinary tract infection
- Candidemia
- Disseminated (systemic, invasive) infection:
  Endophthalmitis (eye) ,Liver and spleen ,Kidneys ,Skin ,Brain ,Lungs ,Bone

Pulmonary Candidiasis	Candidemia
➢Primary pneumonia is less common and could be a result of Aspiration ➢ Secondary pneumonia commonly seen with hematogenous candisiasis Immunocompromised patients ➢Isolation of Candida from sputum is not always significant Clinical features Radiology, Other Lab investigations	▪Increased colonization (endogenous or exogenous factors) ▪Damage in host barriers by catheters, trauma, surgery ▪Immunosuppression ▪Central venous catheters (CVC) Disseminated candidiasis (involvement of any organ) Septic shock Meningitis "very common" Ocular involvement (retinitis) ➢Fever could be the only clinical manifestation "the most common"

Candidiasis Laboratory diagnosis

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Specimen depend on site of infection. Swabs, Urine, Blood, Respiratory specimens, CSF, Blood

Laboratory diagnosis	1. Direct microscopy	2-Culture:	3. Blood culture	4. Serology:	5. PCR
	1-Gram stain,KOH, Giemsa, GMS, or PAS stained smears 2-Budding yeast cells and pseudohyphae will be seen in stained smear or KOH.	**Media:** SDA & Blood agar at 37°C, Creamy moist colonies in 24 - 48hours	first Choice In septicemia **(candidema)**	Patient serum: 1-Test for Antigen , e.g. Mannan antigen using ELISA 2-Test for Antibodies	

Laboratory identification of Yeast

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,
-Use Carbohydrate assimilations and fermentation.
-Commercial kits available for this like: API 20C, API 32C
-Culture on Chromogenic Media (CHROMagar™ Candida)

Treatment

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Oropharyngeal:	• Topical Nystatin suspension, Clotrimazole troches , • Micon**azole**, Fluconazole suspension
Vaginitis:	• Micon**azol** , Clotrim**azole**, Fluconazole
Systemic treatment of Candidiasis	• Fluconazole • Voriconazole • Caspofungin • Amphotericin
In candidemia	• 1-Treat for 14 days after last negative culture and resolution of signs and symptoms • 2-Remove catheters, if possible
Points to consider:	• 1-C. glabrata can be less susceptible or resistant to fluconazole • 2-C. krusei is resistant to fluconazole

QUESTIONS

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Q1 :30-year old patient came to the clinic with oral thrush caused by candida you have to screen him for ?

A. HIV
B. HBV
C. TB

Q	A
1	A
2	b

Q2 :what is the causative agent for patient with these laboratory *findings*

Germ tube test :	+
Chlamydospore production in corn meal Agar	+
Resistance to 500 µg/ml Cycloheximide	+

A.C.Parapsilosis B. Candida-albicans C. C.tropicalis, D.C.glabrata,

For any suggestions or problems please contact
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Thank you