

HISTOPLASMOSIS

Microbiology III

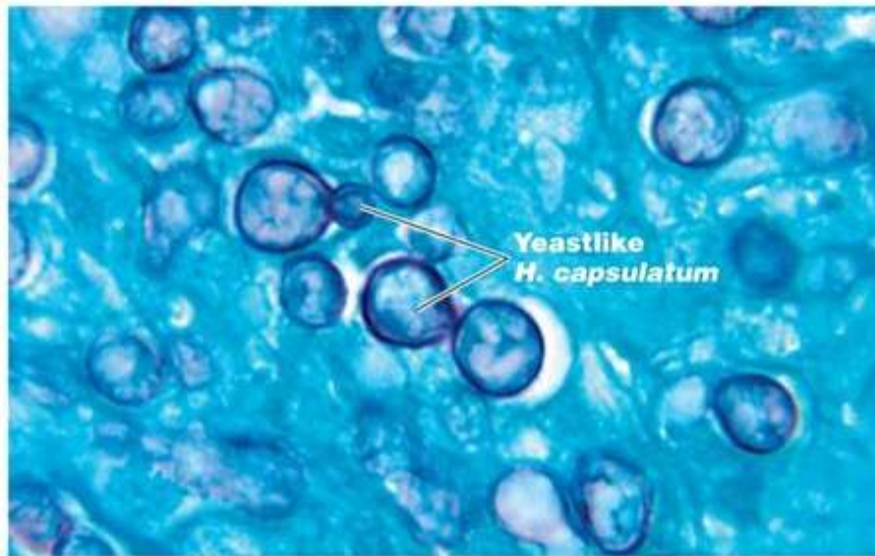
Introduction

- Histoplasmosis is caused by a fungus called *Histoplasma capsulatum*.
- Many are infected by it but only few cases are fatal.
- In the United States about 40 million are infected.

Causative agent: *Histoplasma capsulatum*

- Normally found in the soil as a mold
- It's a dimorphic fungus.
- **Yeast form:** at 37°C in the body or in a laboratory incubator, with oval budding cells
- **Mold form:** at 25-30°C
- with hyphae that bear conidia
- Conidia:
 - Some have smooth surface
 - Others have stubby projections called
 - ***tuberculate conidia***
- Growth: very slow, colonies develop – 2 to 4 weeks

- *Histoplasma capsulatum*, dimorphic fungus



(a) Yeastlike form typical of growth in tissue at 37°C. Notice that one yeastlike cell to the left of center is budding.

LM 5µm

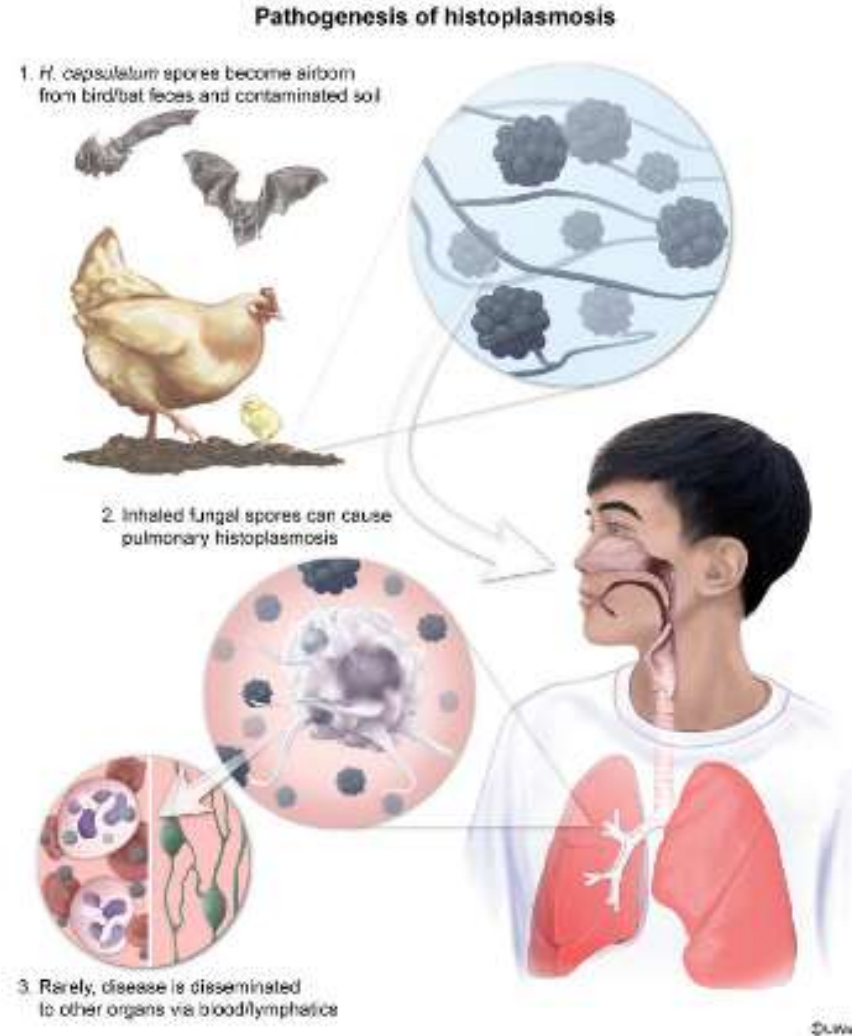


(b) The macroconidia are especially useful for diagnostic purposes. Microconidia bud off from hyphae and are the infectious form. At 37°C in tissues, the organism converts to a yeast phase composed of oval, budding yeasts.

LM 20µm

Transmission

- Habitat: Soil - containing bird or bat excrement that has accumulated for several years
- Excrement greatly enhances growth of the fungus
- Due to high content of nitrogenous compounds
- Humans get infected by inhaling the conidia or hyphal fragments present in soil dust.
- This dust comes from sites such as blackbird roosts, pigeon roosts, and chicken houses, or caves and attics frequented by bats.



Clinical Features

- The disease is asymptomatic in 90-95% of the cases.

Clinical types in humans are:

- Acute Pulmonary Histoplasmosis
- Chronic Progressive Pulmonary Type
- Disseminated Histoplasmosis
- Cutaneous, Subcutaneous and Mucocutaneous Type

Acute Pulmonary Histoplasmosis

- The onset resembles influenza and
- Manifests as:
 - general malaise
 - fever
 - chills
 - profuse sweating
 - sore throat
 - chest pain
 - cough and
 - dyspnea - shortness of breath

Chronic Progressive Pulmonary Type

- This is a variant of acute form and remains latent for a long time
- Gradually produces the same symptoms as the acute disease
- But in a more pronounced form with:
- haemoptysis - coughing of blood and
- apical and subapical cavities – nose.

Disseminated Histoplasmosis

- Occurs mainly in children under two years and elderly adults
- immune system is weak or compromised
- Manifestations:
 - Variable fever
 - Anorexia
 - Weight loss
 - Deterioration of the general condition
 - Anaemia
 - Leukopenia
 - Hepatosplenomegaly and
 - Multiple adenopathy

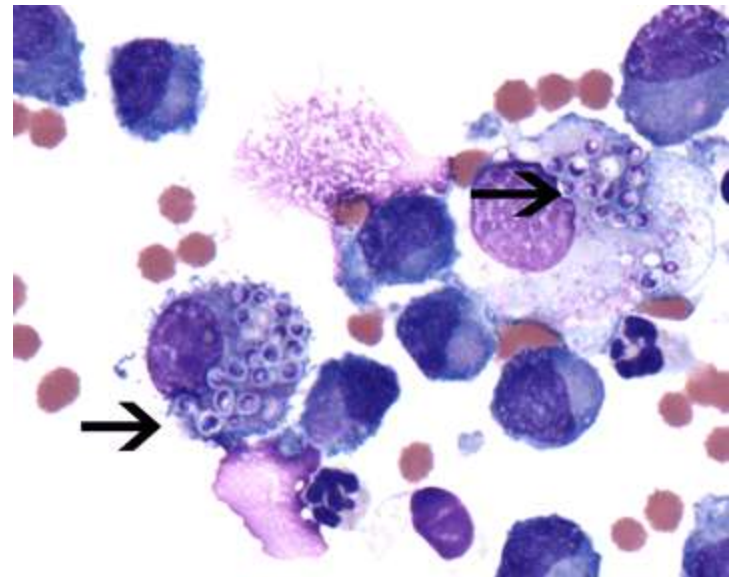
Cutaneous, Subcutaneous and Mucocutaneous Type

- secondary lesions appear on skin and mucous membranes
- Usually occur on abdomen and thorax.

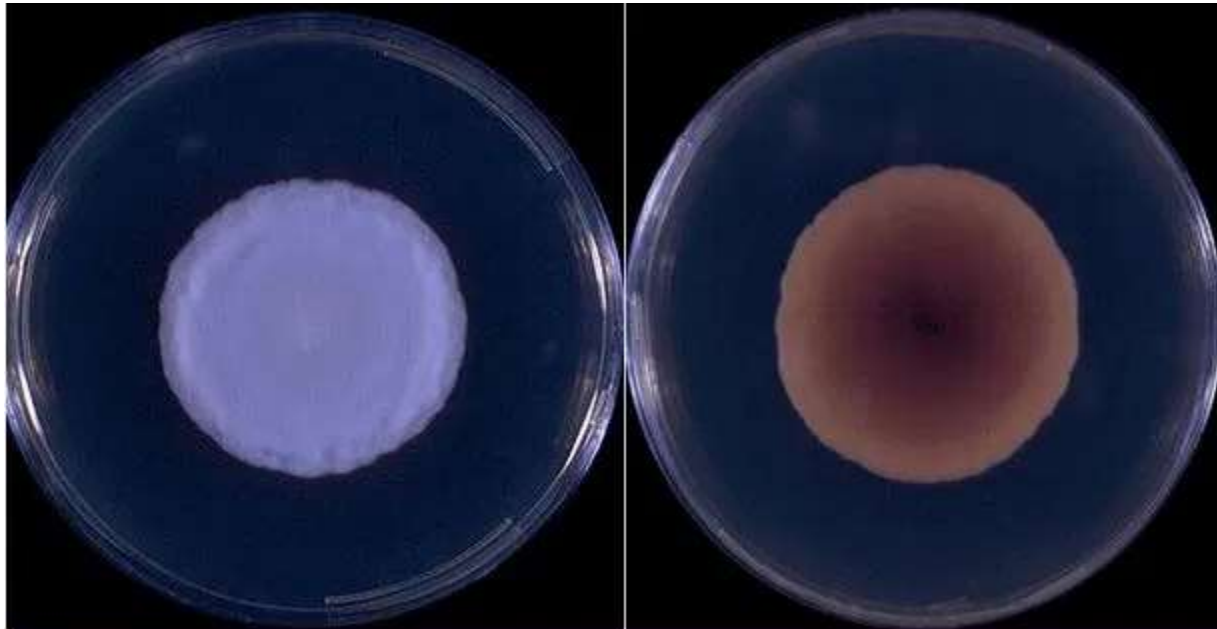


Laboratory Diagnosis

- Tissue specimens from biopsy or surgery samples, spinal fluid, and blood or sputum.
- Direct Examination:
- Thick and thin smears stained with Giemsa's stain.
- Microscopic observation shows oval yeast like cells
- 1 to 5 μm in diameter,
- within the polymorphonuclear cells

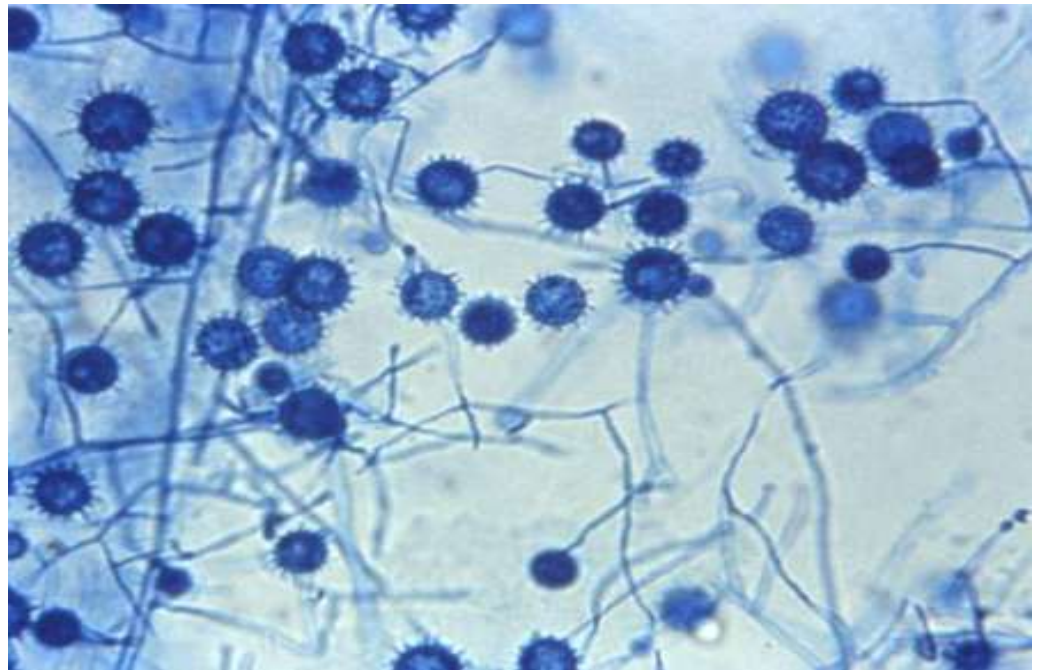


- **Culture:**
- Specimens are inoculated onto Sabouraud's dextrose agar containing antibiotics to suppress bacteria and common fungal contaminants.
- The inoculated medium is incubated at 25°C for up to 12 weeks
- Periodically examined for the characteristic tuberculate conidia
- Conversion to the yeast form can be accomplished by growing
- the organisms at 37°C.



Culture of *Histoplasma capsulatum* on Sabouraud's dextrose agar showing a white suede-like colony with a pale yellow-brown reverse.

- Slides: cultures grown at room temperature
- septate hyphae - small (2-3 μm),
- Conidia - smooth walled, round or pyriform
- tuberculate chlamydospores – large 8-15 μm , round to pyriform are diagnostic features.



Treatment

- In most cases of histoplasmosis the patient recovers spontaneously and no treatment is required.
- Severe cases can be treated with **amphotericin B** and **ketoconazole**.
- No vaccine is available against histoplasmosis.

