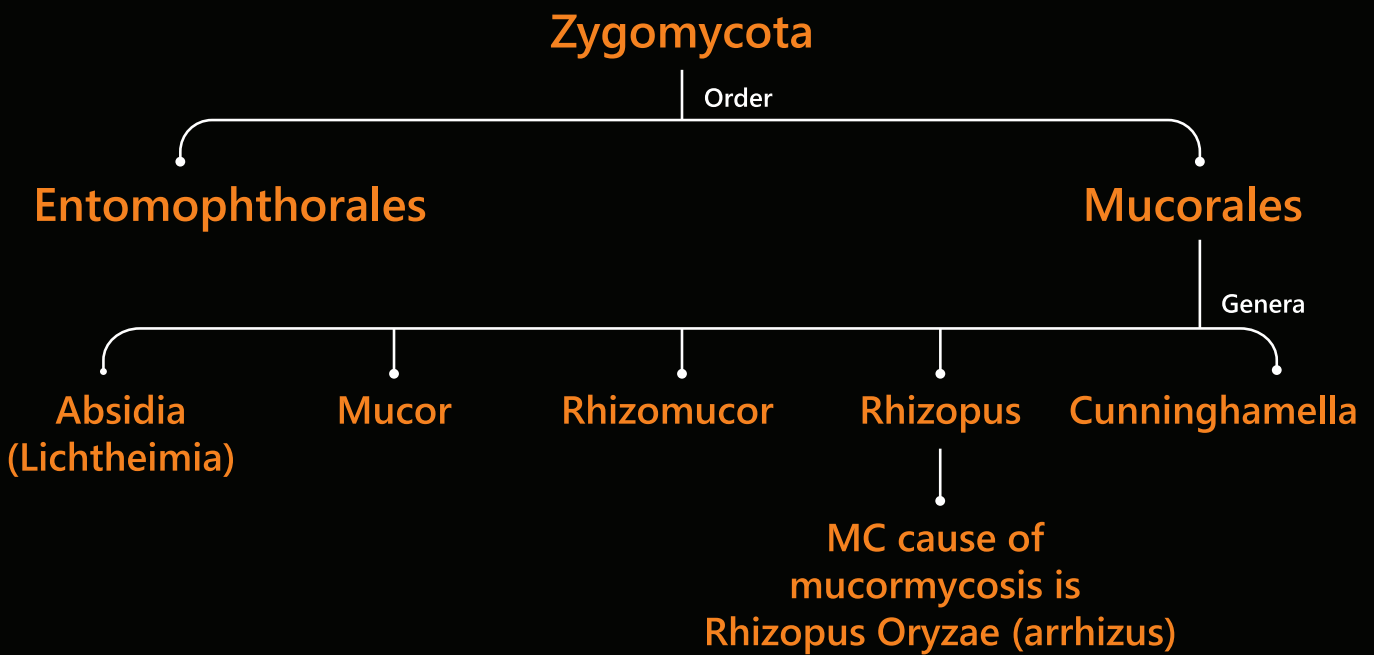
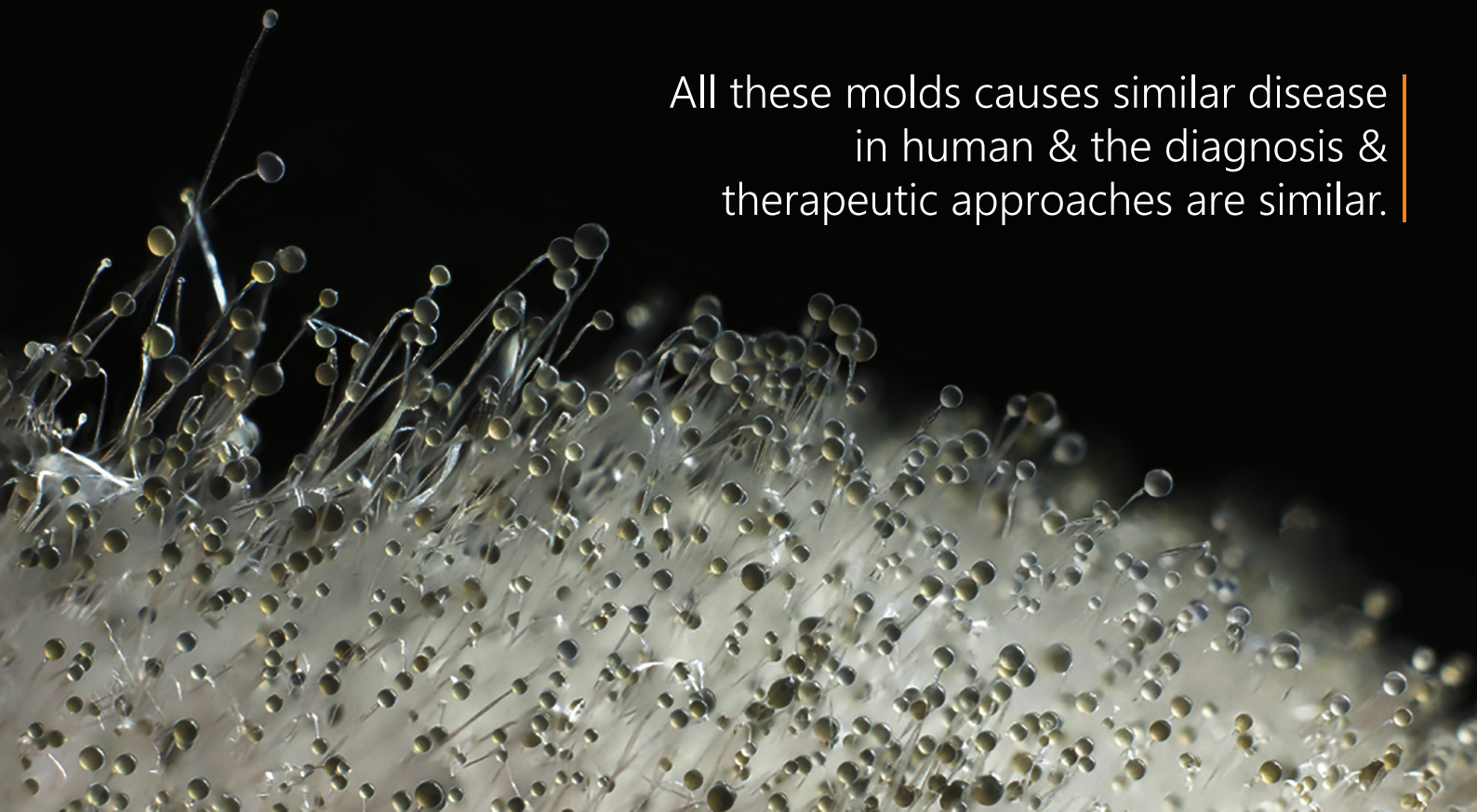


MUCORMYCOSIS

A REAL TIME PCR SOLUTION FOR EARLY DETECTION FROM PLASMA

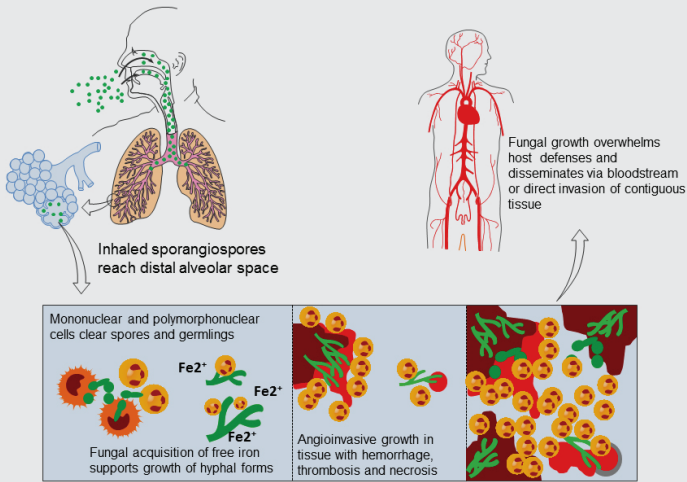


All these molds causes similar disease in human & the diagnosis & therapeutic approaches are similar.



Understand

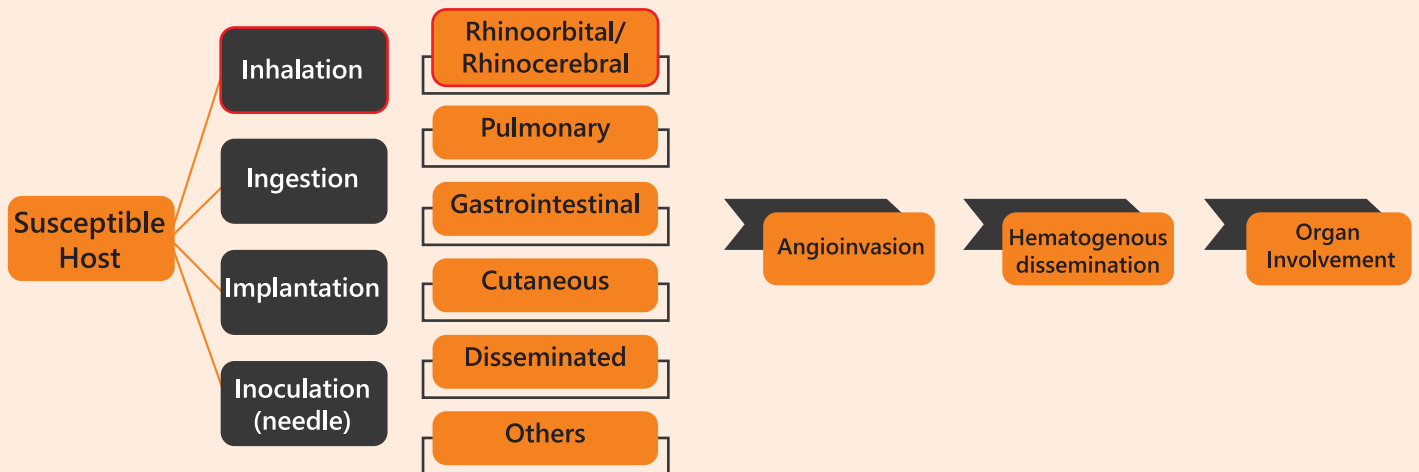
Route of entry



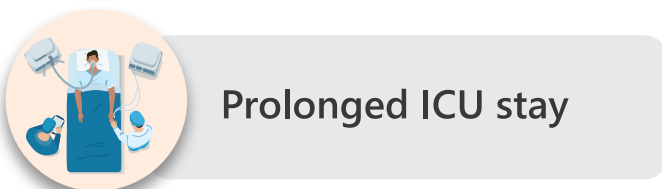
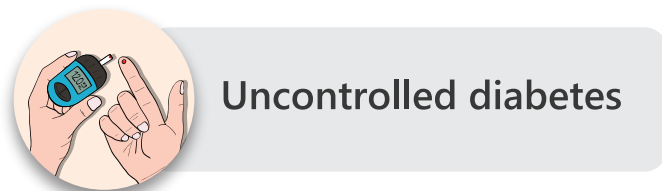
Commonest organ involved with mucormycosis is nose and sinus (~88.9%), followed by rhino-orbital (~56.7%) and Rhino-orbital Cerebral type (~22.2%).

Mucormycosis can't spread between people or between people and animals. Hence, it not contagious.

Clinical forms of Mucormycosis



Predisposing factors



Do's

- Control hyperglycemia
- Monitor blood glucose level post covid-19 discharge
- Use steroid judiciously-correct timing, correct dose and duration
- Use clean, sterile water for humidifiers during oxygen therapy, avoid use of industrial oxygen and contaminated oxygen tubings
- Use antibiotics/ antifungals judiciously

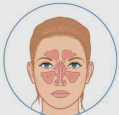
Dont's

- Do not miss warning signs & symptoms
- Don't consider all cases of blocked nose as cases of bacterial sinusitis, esp in the cases of immunosuppression and/ or COVID-19 patients on immunomodulators
- Don't hesitate in seeking aggressive investigations as appropriate for detecting fungal etiology
- Don't lose crucial time to initiate treatment for mucormycosis

Conventional Diagnosis of Mucormycosis

Rhino-orbito-cerebral mucormycosis

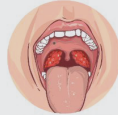
Symptoms



Nasal or sinus congestion



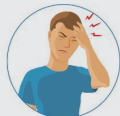
Swelling in one side of the face



Black lesions on the nose bridge and/or the upper hard palate inside the mouth

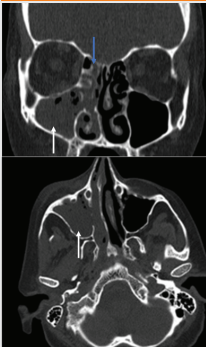


Fever

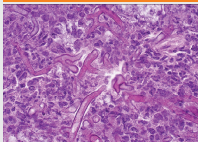


Headache

Imaging



Histopathology Gold Standard



Culture



Diagnostic problems with mucormycosis

Galactomannan: used for aspergillosis

Beta-D-glucan: a pan-fungal marker except for mucormycosis

Confirmatory tests are tissue based & invasive

No biomarker available for mucormycosis

Critical patients are not fit for obtaining tissue sample

No blood or serum based test available for mucor

**Think Fungus
Save Lives**

Some fungal infections can look like other illnesses. Early diagnosis and proper treatment are essential.

Real time PCR test for mucormycosis (Mucorales Species)

Principle

This molecular test is based on real time PCR technology wherein primers and probes are used which target the Mucorales species. Presence of mucormycosis produce fluorescence in the detection channels

Advantage

- Currently diagnosis is done by **invasive methods**: Histopathological examination and positive culture of Mucorales species. A molecular diagnostic approach detect **circulating DNA** of Mucorales in plasma in at-risk patients. This may help to diagnose invasive mucormycosis more quickly and introduce directed therapy earlier
- Sensitivity ~75%
- A positive Real Time PCR test result from blood sample **precedes a positive culture** result by several days to weeks (median 8 days). Clinically and radiologically, mucormycosis is often indistinguishable from other fungal infections such as aspergillosis. Thus, early specific diagnosis and prompt therapeutic intervention with active antifungal treatment such as amphotericin B are essential for improving outcome of mucormycosis
- Especially useful in cases in which sampling is not feasible for culture or histopathological diagnosis (as in critical patients)

Sample type: Collection, transport and stability

- EDTA Plasma (≥ 2 ml)
- Brochoalveolar lavage (BAL) (1-2 ml) • Tracheal aspirate (1-2 ml)
- Sputum (1-2 ml) • Pleural fluid (1-2 ml)
- Paraffin embedded tissue samples (FFPE)
- Fresh tissue sample (in normal saline)

In sterile screw capped container

Stability: Room temperature - 6 hrs, Refrigerated - 1 week, Frozen - 4 weeks

Turnaround time (TAT): 24 hrs

References:

- Mercier T, Reynders M, et al. Serial Detection of Circulating Mucorales DNA in Invasive Mucormycosis: A Retrospective Multicenter Evaluation. J Fungi (Basel). 2019 Dec 3;5(4):113.
- A. Singh, R. Singh, et al. Mucormycosis in COVID-19: A systematic review of cases reported worldwide and in India, Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 2021

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