

REVIEW ARTICLE

Black Fungus Disease

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Introduction

It is a rare fungal infection reported among the post covid cases and immune compromised patients during the second wave of COVID- 19 pandemic. It affects mainly nose, eyes, sinuses and lungs after inhalation of the spores and it causes severe clinical symptoms in the patients. It is an aggressive life threatening infection requiring early diagnosis and treatment.

Definition

It is a fungal infection caused by a fungus, also termed as Mucormycosis / zygomycosis.

Causes

- Glomeromycota group of microorganisms
- Rhizopus species and Mucor species
- Syncephalastrum species
- Cunninghamella bertholletiae
- Apophysomyces
- Lichthemia and Saksenaea

Mode of spread

- Through the inhalation of fungal spores found in the soil
- Ingestion
- Traumatic inoculation

Risk Factors

- Diabetes
- Cancer
- Kidney ailments
- Severe Immune compromised individuals
- HIV/AIDS
- Organ Transplantation

Types

- **Rhino cerebral:** In this type, sinuses and brain are affected in diabetes patients.
- **Pulmonary:** Lungs are most commonly affected; cancer patients, organ transplant clients are affected commonly.
- **Gastrointestinal:** Premature babies, infants and low immunity individuals.
- **Cutaneous:** It affects the skin after skin injury, burns and common among diabetes, graft, HIV patients and intravenous drug users.
- **Disseminated:** If the infection spreads to other organs through blood, it is called as disseminated.

Pathophysiology

Fungus enters in to the body via inhalation, ingestion and inoculation and then its starts to grow and invade blood vessels producing tissue infarction, necrosis, and thrombosis according to the parts of the body involved (nose, lungs, GI disease and skin).

Clinical Manifestations

1. Rhinocerebral (sinus and brain)

- One side facial swelling
- Headache
- Nasal or sinus congestion
- Black lesions on nasal bridge or mouth
- Fever

2. Pulmonary Mucormycosis

- Fever
- Chest pain

- Cough
 - Shortness of breath
- 3. Gastro intestinal**
- Abdominal pain
 - Nausea and vomiting
 - Gastrointestinal bleeding
- 4. Cutaneous (Skin)**
- Blisters, Ulcers
 - Infected area turns black
 - Pain
 - Warmth, excessive redness or swelling around a wound
- 5. Disseminated Mucormycosis**
- It occurs when the infection spreads through the blood stream to affect another part of the body. Eg. Spleen, Heart

Diagnostic Evaluation

It becomes fatal if not diagnosed and treated quickly at early stages. Laboratory and imaging tests are required to find out the evidence of mucormycosis. Following tests can help in identification of the disease:

- Laboratory test of fluid sample from respiratory system
- Immunodiffusion (ID)
- Complement fixation
- Enzyme Immuno Assay (ELISA)
- Tissue biopsy
- CT-scan

Management

Antifungal medicines such as Liposomal Amphotericin B in initial dose of 5 mg per kg body weight is usually prescribed. It is an effective antifungal agent to treat

life-threatening infections and is administered for an additional 3-6 weeks to eradicate the infection. Monitoring for kidney function test and electrolytes is recommended. Following this, it has to be stepped down to oral Isavuconazole 200 mg 1 tablet 3 times every day for two days followed by 200 mg daily or posaconazole 300 mg delayed release tablets twice a day for one day followed by 300 mg every day shall have to be given for prolonged period. After administration of drugs, surgical removal of the 'Fungus ball' is indicated. It may involve the removal of palate, nasal cavity or eye structures. Surgery may be extended for more than one operation. Adjunctive therapy such as Hyperbaric oxygen may be beneficial because higher oxygen pressure increases the ability of neutrophils to kill the fungus.

Case Report

The disease is being detected among patients who are recovering from COVID-19 and among diabetics and whose immune system is not functioning well. India reported 45,374 black fungus cases and 4,332 deaths.

Prevention

- Maintaining good personal hygiene
- Use Mask
- Periodic health exams even after recovered from COVID to maintain normal blood sugar level.
- Wearing shoes, long sleeves shirts, long trousers and gloves while handling soil, manure.

References

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