

White Fungus, Yellow Fungus and Black Fungus Pathetic Covid Patients in India

A. Sanjaikumar¹, C. Kokila²

¹M. Sc (Nursing), Associate Professor, Medical Surgical Nursing, Tamilnadu, India

²Student, M. Sc Nursing First Year, Swami Vevakandha College of Nursing, Tamilnadu, India

1. Introduction

Fungus is separate from the plants and animal kingdoms. They are ubiquitous in nature and are found in the soil, plants, decaying organic matter, water, air, damp places, and also in humans and animals. They play a very important role in our ecosystem along with bacteria, by degrading organic matter into simpler forms for the consumption of plants. "They include the household yeast, molds, mushrooms, and several others.

There are about 1, 44,000 species of fungus, out of which some of them are pathogenic to humans. The most common

being Candida, Aspergillus, Cryptococcus, Histoplasma, Pneumocystis, and Mucormycetes,"

It affects the sinuses, the brain and the lungs and can be life-threatening in diabetic or severely immunocompromised individuals, such as cancer patients or people with HIV/AIDS.

Doctors believe mucormycosis, which has an overall mortality rate of 50%, may be being triggered by the use of steroids, a life-saving treatment for severe and critically ill Covid-19 patients.



White Fungus

Definition

White fungus infections are named after white-colored sores that occur in patients. The sores affect the esophagus and cause difficulty in swallowing food. White patches are also commonly found in the mouth.

Causes

- Aspergillosis

Risk factors

- Immunocompromised patients
- Diabetics Mellitus
- Cancer Patients
- Who have undergone organ transplants

Mode of transmission

- Improperly sterilized medical equipment
- lack of personal hygiene

Symptoms of white fungus

- Cough
- Fever
- Diarrhea
- Dark spots on lungs
- Reduced oxygen level
- White patches in oral cavity
- Skin lesions

Diagnostic Evaluation

- History collection and physical examination
- X-Rays
- Nasal swab culture
- polymerase chain reaction
- Computer tomography
- Magnetic resonance imaging

2. Treatment

Medical management

- Antifungal drugs (Fluconazole, Itraconazole, Posaconazole, Voriconazole, Isavuconazole)
- This has to be continued for 4 to 6 weeks with periodic monitoring of kidney functions ,blood electrolytes
- Intravenous antifungal medication Amphotericin B
- Proper Control diabetes mellitus

Surgical management

- Surgical debridement

Prevention

- Maintain your surroundings clean and free from dust.
- Proper sugar control
- Avoid self-medication without doctors order
- Use of sterile or distilled water for humidification of oxygen
- Use clean mask
- Exposure to moist, damp and dusty areas should be avoided
- Advice to use clean masks, full sleeve shirts, long trousers, gloves while handling soil
- Personal hygiene should be maintained through scrub bath
- Take nutritious diet including vitamins A,C, E,D, Folic acid, Iron, Selenium, Zinc
- Avoid prolonged using of antibiotics, immunosuppressive drugs and steroids without doctors order

Yellow fungus

Unlike black and white, yellow fungus starts internally, causes pus leakage, and leads to slow healing of wounds. In some serious cases, it could further lead to devastating symptoms like organ failure and acute necrosis (cell injury).

Risk factors

- Prolonged use of steroid,
- Contaminated environment
- Uncontrolled diabetes
- Unhygienic or dirty surroundings
- Unhygienic habits
- Lesser immunity
- Co-morbidities

Symptoms of yellow fungus

- Lethargy
- Poor appetite or no appetite
- Weight loss or poor metabolism
- Sunken eyes

Diagnostic Evaluation

- History collection and physical examination
- X-Rays
- Nasal swab culture
- polymerase chain reaction
- Computer tomography
- Magnetic resonance imaging Treatment

Medical management

- Antifungal drugs (Fluconazole, Itraconazole, Posaconazole, Voriconazole, Isavuconazole)
- This has to be continued for 4 to 6 weeks with periodic monitoring of kidney functions ,blood electrolytes
- Intravenous antifungal medication Amphotericin B
- Proper Control diabetes mellitus

Surgical management

- Surgical debridement

Prevention

- Fungal infections generally spread through bad hygiene, so it is important to have good hygiene habits.
- Keep your surroundings clean.
- Remove stale food from the house to prevent the growth of fungus or bacteria.
- Humidity also plays an important role, so keep your humidity level between 30% to 40%.

Black fungus

Black fungus or 'mucormycosis' is a life-threatening disease, which has infected COVID-19 patients and recovered patients as well. The fungus is caused by Mucormycetes -- a type of fungi -- present in the environment. The fungus surrounds the blood vessels and destroys them resulting in tissue necrosis (death of body tissue) and can even lead to death.

Causative Organism

Black fungus is caused by organisms called Mucormycetes. These are naturally present in soil and decaying organic matter, but once inside humans, they can infect air pockets behind the forehead, nose, and cheekbones and between the eyes and teeth.

Types of mucormycosis

Two types of mucormycosis

- **Rhino-Orbito-Cerebral Mucormycosis (ROCM)**
ROCM means the mucormycosis in which the fungus affects the nose, eyes and brain. This disease originates from the nose and rapidly spreads along the sinus passage to infect the orbit (bone cavity which surrounds the eye) and brain.
- **Pulmonary mucormycosis**
Primarily affecting the lungs and respiratory system, pulmonary mucormycosis is common among immunocompromised patients whose immune systems have lowered ability to fight infections and diseases.

Risk factors

- People with less immunity
- Malnutrition
- Those taking immunosuppressant medications, steroids and Chemotherapy
- People with chronic kidney, liver and lung disorders & AIDS
- Burn injury, Skin damage
- Prolonged ICU stay
- Critical COVID-19 patients with diabetic Mellitus

- Moisture in the environment, unclean environment in which patients are treated and oxygenated can be a big source of infection.

Common symptoms

- Nasal blockage
- Bleeding
- Discharge from nose
- Facial pain
- Swelling
- Numbness
- Blurring of vision
- Double vision or watery eyes

Medical management

- Antifungal drugs (Fluconazole, Itraconazole, Posaconazole, Voriconazole, Isavuconazole)
- This has to be continued for 4 to 6 weeks with periodic monitoring of kidney functions, blood electrolytes
- Intravenous antifungal medication Amphotericin B
- Proper Control diabetes mellitus

Surgical management

- Surgical debridement, in this procedure the dead portions of nose, orbit etc have to be surgically excised.
- Most of their patients arrive late, when they are already losing vision, and doctors have to surgically remove the eye to stop the infection from reaching the brain.
- Sometimes black fungus spread to jaw; here doctors have to surgically remove the jaw bone in order to stop the disease from spreading.
- If the infection has largely spread to different parts of the body and cannot be cured with medications

Prevention

- Maintain good hygiene and cleanliness in your surroundings.
- Maintain oral hygiene care with mouthwash, povidone-iodine gargles.
- Use sterile water for humidification while administering oxygen, there should be no leakage from the humidifier.
- Steroids usage should be limited not more than necessary with strict blood glucose control.
- Avoid unnecessary use of broad-spectrum antibiotics or antifungals, can result in growth of unwanted bacteria or organisms.

3. Conclusion

We are learning more about the new and long-term manifestations of the Covid-19 infection. Its association with invasive mucormycosis sinusitis is dangerous and must be given serious consideration. Uncontrolled diabetes and over-zealous use of steroids are two of the main factors aggravating the illness, and both of these must be properly checked. If infected, early surgical intervention and intravenous anti-fungal treatment should be sought for management, as a good prognosis and less fulminant disease course can be achieved in cases of post-coronavirus mucormycosis.

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