International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Mucormycosis: Black Fungus

Nirmala M

Professor, HOD, Medical Surgical Nursing Department, PSG College of Nursing, Coimbatore, India

Abstract: ***Mucormycosis is a serious fungal infection that mainly affects people who are on medications for other health care problems that reduces their ability to fifth environmental pathogens. Functioning and health immune system protects the majority of the population from developing the rare diseases. Fungi are unable to penetrate the epithelial layer, the first layer of defense, whereas in the presence of a destabilized immune system which is most often seen in conditions such as Diabetes Mellitus, Chemotherapy or Corticosteroids use and recovering from covid-19, the fungi are able to penetrate normal mucosal barriers and invade host tissues. An appropriate analysis and classification of these fungal disorders needs a good positive reception and knowledge about the host's immune status along with other key scientific characteristics.***

Keywords: Mucormycosis, zygomycosis, destabilized immune, mucosal barriers

1. Introduction

Mucormycosis (zygomycosis) is a stern but exceptional fungal infection caused by a group of molds called mucormycetes. These molds live all through the environment. Mucormycosis largely affects people who have health issues or receive medicines that lower the body's capacity to fight germs and sickness. It most frequently affects the sinuses or the lungs after inhaling fungal spores from the air. It can also occur on the skin after a cut, burns, or any other type of skin injury.

Epidemiology

The incidence may be more in mucormycosis, as many of the cases stay behind undiagnosed due to complexity in collecting the sample from deep tissue and low sensitivity of diagnostic tests. The Leading International Fungal Education (LIFE) portal has predicted that the burden of serious fungal infections globally is very high. According to their estimate, the annual prevalence of mucormycosis might be around 10,000 cases in the world excepting India. After the addition of Indian data, the approximation of mucormycosis rose to 910,000 cases internationally**.** The estimated incidences per million populations in different continents were, Europe 0.2 cases, Denmark 95 cases in Portugal, USA 3.0 cases, Canada 1.2 cases and Australia 0.6 cases. A computational-based approach anticipated the prevalence of mucormycosis at 140 cases per million populations in India, with the pervasiveness ranging between 137,807 cases to 208,177 and attributable mortality at 65,500 per year.

Incidence

Reports are out of an infection called mucormycosis, termed "black fungus", in patients with COVID- 19, or who are recovering from COVID, in India. Fungal infections can be devastating. Mucormycosis is adding to the burden of suffering in the country already in a deep COVID crisis. As of March 2021, 41 cases of COVID-19- associated mucormycosis had been documented around the world, with 70% in India. In India around, 24 cases of fungal infection were found in Mumbai, eleven of them had to lose an eye and six of them died. Most of them were middle aged diabetic patients who were affected by the fungus two weeks after recovering from Covid – 19. Ninteen cases were reported in Bengalaru, most of them were young people between the age of 35-45 years old. Reports propose the number of cases is now much higher, which is expected given the current wave of COVID infections in India.

Transmission

There are two main types of infection, depend on the route of exposure. In the pulmonary or sinus form, exposure occurs by inhaling fungal spores from the atmosphere. These spores can cause an infection to expand in the lungs, sinuses, eyes, and face, and in rare cases can multiply to the central nervous system. In the cutaneous form, the fungus can enter the skin through cuts, scrapes, puncture wounds, or other forms of trauma to the skin. Mucormycosis is not infectious and does not spread from person to person. It can be reach through Inhalation, Inoculation, Ingestion of spores from the environment. Although most cases are sporadic, healthcare-associated outbreak have been associated to adhesive bandages, wooden tongue depressors, hospital linens, negative pressure rooms, water leaks, poor air filtration, non-sterile medical devices, and building construction. Community-onset outbreaks have been related with trauma sustained during natural disasters.

Etiology

- An individuals with a weakened or compromised immune system
- Breathing in mold spores.
- Low levels of neutrophils (neutropenia)
- Undergone hematopoietic stem cell transplantation (HSCT).
- Poorly-controlled diabetess
- Prolonged ICU stay
- Iron overload(frequent blood transfusions) or in certain blood disorders,
- Kidney insufficiency;
- Cancer patients & HIV/AIDS affected persons
- The use of contaminated medical equipment
- Long-term use of corticosteroids
- Skin trauma including burns or other injury to the skin
- Extreme malnutrition
- Illegal drug use involving needles.
- Premature newborns

Types of mucormycosis

a) **Rhinocerebral mucormycosis (sinus and brain)** is an infection in the sinuses that can spread to the brain. This form of mucormycosis is most familiar in people with uncontrolled diabetes and kidney transplanted patient.
b) **Pulmonary mucormycosis (lung)** is the most common type of mucormycosis in people with cancer and in people who have had an organ transplant or a stem cell transplant.
c) **Gastrointestinal mucormycosis** is more widespread among young children than adults, particularly premature and low birth weight infants less than 1 month of age, who have had antibiotics, surgery, or medications that lower the body's ability to fight germs and sickness.
d) **Cutaneous mucormycosis (skin)** occurs after the fungi enter the body through a break in the skin (for example, after surgery, a burn, or other type of skin trauma). This is the most common form of mucormycosis among people who do not have destabilized immune systems.
e) Disseminated mucormycosis occurs when the infection spreads through the bloodstream to have an effect on another part of the body. The infection most recurrently affects the brain and other organs such as the spleen, heart, and skin.

2. Signs and Symptoms

- Nasal congestion, nasal discharge (blackish/bloody), and sinusitis.
- A fever and headache.
- Tissue loss (necrosis) of the roof of the mouth (palate),
- Disintegration of thin wall of cartilage and bone (septum) that divides the nostrils (septum),
- Swelling of the area around the nose (perinasal area), and redness (erythema) of the skin overlying the sinus and the eye socket (orbit).
- Cyanosis of the skin near the sinuses & eye socket
- Blurry vision or double vision.
- Thrombosis
- Chest pain, pleural effusion
- Lethargy, seizures,
- Slurred speech, partial paralysis,
- Cranial neuropathies
- A brain abscess, altered consciousness, and
- Coma.

Diagnosis

- Fungal culture
- Pathological and microbiological & histopathology tests
- Polymerase chain reaction (PCR)
- Computerized tomography (CT) scanning
- X-rays

Treatment

- Maitain adequate hydration
- Antifungal medications for 6 weeks
- Amphotericin B, Posaconazole or Isavuconazole treatment
- Salvage therapy - Posaconazole or isavuconazole may be given intravenously.
- Surgery- Lobectomy
- Adjunctive hyperbaric oxygen

Management

- Advice the patient to wear mask while visiting the hospital or crowds
- Advice to wear long sleeve shirts and gloves while handling the things
- Advice to maintain personal hygiene including through scrub bath
- Advised to remain indoors until they regain their natural strength and immunity
- Controlling Diabetes Mellitus and Diabetic Keto - acidosis
- Advice to reduce the steroids or to discontinue rapidly
- Advice to continue the medical treatment
- Monitoring the patient clinically with the help of radio imaging.

References

[1] Petrikkos G Skiada A etal, "Epidemilogy and clinical manifestations of mucormycosis, Clinical infectious Disease, 2012,Feb :54 Supplement : 23:24
[2] Center for disesase control and prevention, January 14, 2021
[3] Anna Skida - et al, Diagnosis and treatment of mucormycosis in patients with hematological malignancies: guidelines from the 3rd European Conference on Infections in Leukemia haemotologica, 2013 Apr; 98(4): 492–504
[4] Soutik Biswass, Mucormycosis: The 'black fungus' maiming Covid patients in India, BBC News,2021.
[5] Quixplained: What is mucormycosis or 'black fungus' in Covid-19 patients, New Delhi | Updated: May 21, 2021
[6] T.S. Suryanarayanan, R. Uma Shaanker, Institute of Tropical Mycology (VINSTROM), Chennai. COVID-19 and Black Fungus: What Is Mucormycosis, Health the sciences, May 2021.
[7] Coronavirus Black Fungus Infection: Signs, Symptoms And Everything We Know About The Deadly Fungal Infection Times of india.Com | Last Updated On - May 20, 2021.