



THE SPREAD OF "BLACK FUNGUS" IN INDIA-AN EPIDEMIC

Microbiology

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ABSTRACT

Mucormycosis is a life-threatening infection caused by fungi of the order Mucorales. Recent reclassification has abolished the order Zygomycetes and placed the order Mucorales in the subphylum Mucormycotina. Therefore, we refer to infection caused by Mucorales as mucormycosis, rather than zygomycosis. This disease is increasingly recognized in recently developed countries, such as India, mainly in patients with uncontrolled diabetes or trauma and also seen in the patients who just recovered from the COVID-19. The most important conditions predisposing to mucormycosis, according to various studies, include malignant hematological disease with or without stem cell transplantation, prolonged and severe neutropenia, poorly controlled diabetes mellitus with or without diabetic ketoacidosis, iron overload, major trauma, prolonged use of corticosteroids, illicit intravenous drug use, neonatal prematurity and malnourishment. The most common reported sites of invasive mucormycosis have been the sinuses (39%), lungs (24%), and skin (19%). Dissemination developed in 23% of these cases. The overall mortality rate for the disease is 44% in diabetics, 35% in patients with no underlying conditions, and 66% in patients with malignancies. The mortality rate varied with the site of infection and host: 96% of patients with disseminated infections, 85% with gastrointestinal infections, and 76% with pulmonary infections died. In children, mucormycosis manifested as cutaneous, gastrointestinal, rhinocerebral, and pulmonary infections in 27%, 21%, 18%, and 16% of cases, respectively, in one study. The skin and gut are affected more frequently in children than in adults.

KEYWORDS

Mucormycosis, Diabetes mellitus, COVID-19, Malignant hematological disease, Corticosteroids, Neonatal prematurity, Malnourishment.

INTRODUCTION:

Mucormycosis is also called as ZYGOMYCOSIS. It is a serious but rare fungal infection caused by group of molds which is called as MUCROMYCETES. This fungi are particularly found in soil & in decaying organic matter such as leaves, compost piles or rotten wood. People suffer mucormycosis by coming in contact with 'fungal spores' which is found in the environment. Let me explain with an example lungs or sinus form of the infection can occur after someone breathes in spores these type of mucormycosis occur in people who have health problem or the one who taking medicine with lower the body ability to fight with germ & sickness. Also mucormycosis develop on skin when the fungus enter the skin through cut, scrape, burn or through other type of skin trauma. Mucormycosis or Black fungus has emerged as a cause for concern with a number of states declaring it is an epidemic. Nearly 9000 confirmed case of the rare disease have been reported from across the country mostly in recovered COVID-19 patient.

- Sinus pain
- Nasal blockage on one side of face or one side headache
- Swelling or numbness
- Toothache & loosening of teeth
- Blurred vision
- Discoloration or blackening of tissue on nose & cheeks
- Black lesion inside the mouth
- Watery & Redness of eye
- Drooping of eyelids

DIAGNOSIS:

The symptoms of Mucormycosis include one-sided nose block, bloodstain, brown-colored secretion from the nose accompanied with swelling of the cheeks, slow progressive swelling of the eyeball, headache, decrease in vision, and then eventually, it can lead to stroke or hemiplegia. **Educating patients about the symptoms is crucial as it will help in the early detection of the condition.** It is important to identify the fungal infection in the early stage. The infection generally starts from the nose and then spreads to cheekbones, palate, eyes and can go into the brain. Immediate consultation with the doctor is necessary to avoid complications.

Test that we done is Nasal endoscopy test with biopsy.

TREATMENT:

- Sugar control
- Stop steroid
- Liposomal Amphotericin B injection

Some other antifungal.

Surgical debridement or removal of necrotic material for drug penetration.

After discharge posaconazole 3 to 6 months.

PREVENTION:

In hospital:

Maintenance of good hygiene & cleanliness is must. Regular oral hygiene care with mouth wash, povidone-iodine gargles must be done.

While administration oxygen, water for humidification must be sterile and there should be no leakage from the humidifier.

Steroid usage must be limited to no more than necessary with strict blood glucose control.

Unnecessary use of broad spectrum antibiotics, antifungals should not do as this remove the normal commensal flora resulting in the growth of unwanted organism due to lack of competition.



CAUSE AND SYMPTOMS:

Black fungus is caused by fungal spore found in soil & organic matter usually inhaled by human from the air. The moulds enter the body and then manifest around the nose, eye socket and if it not stopped will move fatally into the brain. It can spread fast in those with compromised immunity. The rise in Black fungus infection mostly in patient who had severe cases of covid-19 linked to an overuse of steroid in treatment of corona virus which can acutely compromise the immune system if taken over a prolonged period. **High incidence of diabetes in India also been blamed with high sugar level to susceptibility.**

SYMPTOMS:

ONE DISCHARGED:

- Stay indoor as much as possible
- Regular exercise
- Control of blood sugar
- At home surrounding must be clean and free from dust and dampness
- Maintain oral and nasal hygiene
- While going out always wear N-95 mask
- Avoid construction areas, field, grounds

Soil and plants are the areas that abound with fungi hence better to avoid working with soil, gardening. If unavoidable masks, rubber gloves and boots are must.

STATISTICS:

Different descriptive statistical method use to analyzed the demographic characteristics as well as calculate the different in two group. Student's t -test for independent samples or Fisher's exact test, where appropriate. Statistical significance was established at $P < 0.05$. Data were analyzed using an SPSS statistical package (SPSS Statistics 15.0, SPSS Inc., Armonk, NY). Study also found that 78.9% of mucormycosis patients were men. Study published that 80% of black fungus patients were afflicted with pre-existing diabetes mellitus. At the same time only 14.9% of 101 patients had concomitant diabetic ketoacidosis. Data also shows that 10-20% of the cases of mucormycosis reportedly in India were associated with burns. Mucormycosis cases are also rising because of overuse of steroid. Steroid suppresses immune response which can increase vulnerability to secondary infection like Black fungus.

CONCLUSION:

Mucormycosis is a rare but emerging fungal infection with a high mortality rate. Despite the diabetes epidemic in developed countries, the incidence of mucormycosis in diabetics may be decreasing. In contrast, in developing countries, uncontrolled diabetes mellitus and trauma are the most common risk factors for mucormycosis. COVID-19 pandemic has resulted in widespread mortality, morbidity, social and economic upheavals of an unprecedented magnitude. Global scientific collaboration and reporting of new information related to this is of paramount importance to increase the knowledge with regard to the novel viral infection. The incidence of rhino-orbital-cerebral mucormycosis is likely to rise, both as a co-infection and as a sequelae of COVID-19. A high index of suspicion for mucormycosis based on appropriate risk stratification and improved laboratory diagnosis are important for improving the natural history of this devastating infection. So lastly as we all know "**Prevention is better than cure**" so take care of yourself specially if you have diabetes and if you have just cure from COVID-19. Because we see the high incidence of this fungal infection in two group of people.

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