Article

MUCORMYCOSIS: A BRIEF INSIGHT

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Received: 08 June, 2021, Decision for Acceptance: 05 Aug, 2021

Abstract:

Mucormycosis is a fungal infection caused by group of microorganism by phylum glomeromycota. They are ubiquitous found in soil & decaying organic matter and can occurs through inhalation of fungal sporangiospores or direct inoculation of fungal in mouth, eyes, mucosa or disrupted epidermis. During coivd-19 this fatal diseases can be managed by controlling diabetes and diabetic ketoacidosis, judiciously use of steroids, use clean, sterile water for humidifiers during oxygen therapy, use antibiotics/antifungal cautiously, discontinue immunomodulating drugs, and monitor the patients clinically with radio-imaging response to detect the disease progression.

Key Words: Covid-19, Mucormycosis, Steroids, Antifungal, Antibiotics.

Introduction:

Introduction: Mucormycosis is a rare, fatal fungal disease that mainly infects the immunosupressed patients in either developing industrialized countries or through environmental conditions. Mucormycetes or Zygomycetes (belongs to the order: Mucorales and Entomophthorales); a group of filamentous molds are responsible for this distinctive angioinvasive infection [1, 2]. Anatomic location wise intrusive mucormycosis is categorized as various clinical forms. The major 6 clinical forms are: rhinocerebral, cutaneous, pulmonary, gastrointestinal, disseminated, and idiosyncratic forms, such as osteomyelitis, endocarditis, peritonitis, and nephrological infections [3]. Mucormycetes species is ubiquitary in nature and the most human infections can occur through the inhalation of fungal sporangiospores or the direct inoculation of the fungus into mouth, eyes, mucosa or disrupted epidermis. The noticeable symptoms of rhinocerebralmucormycosis are: one-sided facial swelling, headache, nasal or sinus congestion, fever, black lesion on nasal bridge or upper inside of mouth. Fever, cough, shortness of breath, chest pain are noticed incase of pulmonary mucormycosis. Cutaneous mucormycosis causes black coloured blisters with pain, warmth, excessive redness or swelling around the infected area and tissue necrosis that turn into black. Thus, it is so called black fungal disease in popular media. Symptoms of gastrointestinal mucormycosis include: gastrointestinal bleeding, abdominal pain, nausea and vomiting. Patients with disseminated mucormycosis in the brain can develop mental disability or coma [4]. The virulence factors of

the fungus to rapidly grow and disseminate in the host due to the cell wall composition and genetic alterations. Expression of CotH proteins on the spores and hyphae facilitates angioinvasion, evading recognition, suppressing immune response resulting the disease manifestations [5]. Phagocytes of normal hosts kill the Mucorales by generating oxidative metabolites and cationic peptides. But, the patients having diabetic ketoacidosis; dysfunctional phagocytes and impaired chemotaxis are unable to kill the fungus by both oxidative and nonoxidative mechanisms [6]. The wake of India's 2nd wave of COVID-19 has been skewed thousands of Mucormycosis cases, bringing worldwide attention to this overlooked rare disease. The incidence is 70 times higher in India than global average [7]. The cases of Mucormycosis have been widely reported in most of the post-COVID immunocompetent patients. This fungal infection has created much havoc showing its devastating effects for the predisposing factors including widespread use or misuse of corticosteroids or combinations of steroids, even though the mild COVID -19 symptoms, uncontrolled hyperglycemic conditions, patients having cancer or HIV, prolonged ICU stay, high iron levels especially deferoxamine, Variconazole therapy, or it can be entered in the human body through the artificial oxygen support given to severe COVID-19 patients or in some cases whether the use of contaminated water to produce medical oxygen [8]. Recent data support that high dose liposomal Amphotericin-B is the considered monotherapy for Mucormycosis and the combination therapy of Amphotericin-B with an Echinocandin or with an azole; Itraconazole or Posaconazole or with all three medications [2]. In case of massive tissue necrosis which cannot be prevented by killing the organism, surgical debridement is the only last option. As per ICMR guidelines, this fatal disease can be managed by controlling diabetes and diabetic ketoacidosis, judiciously use of steroids, use clean, sterile water for humidifiers during oxygen therapy, use antibiotics/antifungals cautiously, discontinue immunomodulating drugs, and monitor the patients clinically with radio-imaging response to detect the disease progression.

ICMR also generated the preventive measures for people to take care of these following:

Use of masks during the visit of dusty constructive area

Wear shoes, long trousers, long sleeve shirts and gloves while handling soil, moss or manure because this sporadic fungus are most commonly found in soil than in air.

Maintain the personal hygiene including thorough hand washing and scrub bathing [9, 10].

Moreover, an unholy trinity of hyperglycemic event, misuse of steroids and some environmental factors in a background of COVID-19 spikes the cases of Mucormycosis. Finally, the immediate diagnosis, reversal of predisposition, and invasive surgical debridement remain the centerpiece therapeutical approach for this lethal disease.

Conflicts of Interest:

The authors declare that they have no conflicts of interest.

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Cite this article

Nikita Pal. Mucormycosis: A Brief Insight, Indian Journal of Healthcare, Medical & Pharmacy Practice. 2021; 2(2):39-41.