

RECENT UPDATES IN MEDICINAL CHEMISTRY AND APPLIED MICROBIOLOGY



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COMPREHENSIVE INSIGHTS INTO MUCORMYCOSIS

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ABSTRACT

Mucormycosis, a rare but life-threatening fungal infection, has gained global attention due to its association with the COVID-19 pandemic. This study provides a comprehensive overview of mucormycosis, encompassing its epidemiology, risk factors, pathogenesis, diagnosis, and treatment. The objective is to enhance understanding and aid in the development of effective strategies for prevention and management. Epidemiological trends demonstrate an alarming rise in mucormycosis cases, particularly in individuals with COVID-19, diabetes, or immunocompromised conditions. The pathogenesis involves the invasion of tissues by Mucorales fungi, leading to devastating consequences. Early diagnosis is critical, involving a combination of clinical, radiological, and microbiological assessments. Timely intervention with antifungal therapy and surgical debridement is imperative for patient survival. The study concludes that increased awareness, risk factor mitigation, and healthcare system preparedness are essential in the battle against *Mucormycosis*.

Key words: Mucormycosis; COVID-19; Epidemiology; Pathogenesis; Diagnosis and Treatment.

INTRODUCTION

American pathologist R.D. Baker coined the term *Mucormycosis*, also recognized as *Zygomycosis*. This refers to a subtle fungal infection caused by members of *Mucorales* and *zygomycotic* species. *Mucormycotina*, common saprobes originating from decaying matter or soils, are implicated. Infections involving *Mucorales* are characterized by swift progression (Kwon-Chung, 2012). In 1885, the German pathologist Paltauf documented the first case of Mucormycosis, terming it *Mycosis Mucorina* (Mohammadi *et al.*, 2014). According to a study in France, there was a 7.4% annual increase in occurrence of *Mucormycosis* (Bitar *et al.*, 2009). The universal incidence and the potential for seasonal variation in mucorales infection have been acknowledged (Petrikos *et al.*, 2012). These potent and extremely damaging infections primarily manifest in individuals with compromised immune systems, particularly in those undergoing hematopoietic stem cell transplantation or individuals with haematological malignancies. Distinct risk groups include diabetic patients with ketoacidosis and individuals with transfusional/dyserythropoetic iron overload. Challenges in diagnosis and subsequent antifungal treatment, compounded by significant intrinsic resistance to commonly employed antifungal drugs, contribute to elevated mortality rates in specific patient populations (Binder *et al.*, 2014).

Mucormycosis, caused by fungi of the order *Mucorales*, is primarily acquired by humans through the inhalation of sporangiospores, ingestion of contaminated food, or inoculation (Ribes *et al.*, 2000; Richardson, 2009). The fungi belonging to *Mucorales* are widespread, exhibiting a



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