



## A STUDY OF THE RISK FACTORS FOR FUNGAL INFECTIONS IN INDIVIDUALS WITH DIABETES

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### KEYWORDS :

#### INTRODUCTION

Diabetes mellitus includes a unit of metabolic disorders marked by elevated high blood sugar levels. According to the CDC, a fasting blood glucose test finding of 126mg/dL or greater or a glucose tolerance test outcome of 200mg/ dL indicates diabetes (Rowley et al., 10). Patients with diabetes are vulnerable to infection and delayed recovery from infections and typically need more hospitalization than the healthy population. With effective management of diabetes mellitus complications, the rate of mortality caused by vasculopathy has considerably reduced, offset by nonvascular root causes, incorporating infection in the last three decades (Carey et al., 514). Fungal infections in patients with diabetes is life-threatening complications with an elevated mortality rate. Patients with diabetes are highly vulnerable to fungal infection. The peril of mycoses elevates 1.38 times in clients with diabetes (Seo, 15). Further, diabetes is broadly identified as a risk element for invasive pulmonary aspergillosis. Notably, diabetes raises susceptibility to multiple forms of infections (Xu and Chen, 40). The most typical fungal infections include invasive candidiasis, [pulmonary aspergillosis, mucormycosis, and cryptococci meningitis (Friedman and Schwartz, 67). Diabetes is a possible risk aspect for invasive fungal disease because of abnormal fungi like *Histoplasma capsulatum*. Fungal in clients with diabetes elevates drug resistance, resulting in poor management of diabetes. Also, biofilm is a primary physical barrier to decreasing antifungal absorption resulting in antifungal tolerance.

#### Objectives

The study's objectives include exploring the risk elements for fungal infections in patients with diabetes.

#### Review of Literature

Rodrigues et al. p.79 examine the relationship between candida sp infections in clients with diabetes mellitus. The researchers confirm that candidiasis cases have increased internationally over the past decades and are a notable cause of mortality and morbidity, particularly among acutely ill clients. Diabetes predisposes patients to fungal infections, including candida-related conditions. This is attributed to the immunosuppressive impact of diabetes on the infected population. The review discusses the recent studies concerning the prevalence of candidiasis in patients with diabetes and the pathophysiology and etiology linked to the co-morbidities. The study engaged an extensive review of literature obtained from reliable databases like PubMed, Springer's SpringerLink, and Scopus. The research confirmed that diabetes mellitus patients possess an elevated susceptibility to fungal infections, including candida sp. infections that exacerbate uncontrolled hyperglycemia cases.

Iqbal et al., E121 examine the risk of chronic pulmonary mucormycosis (PM) in diabetes mellitus. The researchers

state that mucormycosis typically impacts immunocompromised patients with deficits in neutrophil count or function. Diabetes is a critical risk element for mucormycosis because of impaired innate and suppressed immunity. Although the condition is rarely present in diabetic patients, PM is linked to elevated morbidity and mortality. Upon extensive review of studies, the article confirms that diabetes is PM's most typical risk element.

Jabeen et al., 952 assessed the prevalence and possible causes of acute fungal infections in Pakistan. The actual burden of fungal infections is unknown in Pakistan. However, high-risk individuals for fungal infections include patients with diabetes, tuberculosis, chronic respiratory diseases, cancer, HIV infection, and transplant. The country's reporting of fungal infection rates and the general population were revised and employed where necessary. Of Pakistan's population, 184500000 individuals, about 3280549 suffer from an acute fungal infection, excluding other cutaneous infections, allergic fungal sinusitis, and oral candidiasis. The article confirms that diabetes is among the primary risk factors for fungal infections.

#### MATERIALS AND METHODS

A retrospective survey was performed with inpatients aged 18 years and older at KVG Medical College Hospital and engaging patients admitted to the facility from January 2021 to June 2021. Clinical and demographic data were gathered from the healthcare records. The International Classification of Diseases 10th revision coding of discharged diagnosis identified clients with diabetes and diabetes-induced fungal infections. One hundred fifty-two records of patients with diabetes were examined, and 63 of them had fungal infections. The 63 records were reassessed by two researchers employing the diagnostic approach for fungal infections. Three patients were excluded from the study since they were diagnosed with a fungal infection before the diabetes diagnosis was established. All the statistical analyses were performed with the SPSS19 statistical package.

**Table I.1 Determining the Study Sample**

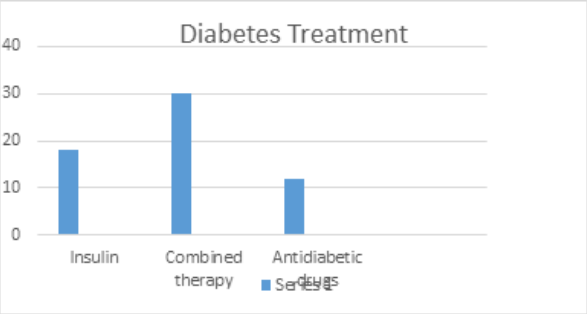
Total patients with Diabetes	Patients with diabetes and fungal infections	Patients with diabetes-induced fungal infections
156	63	60

#### RESULTS AND DISCUSSION

A total of 60 participants with diabetes were included in the study. The mean age was 45 (patients aged 18-85 years). The median period of diabetes at fungal infection onset was 48 months and diabetic nephropathy was diagnosed in 18 (30%) participants. Patients with other immunosuppressing conditions like HIV infection were not included in this study. Further, 42 patients (70%) were on treatment before the onset and diagnosis of fungal infection. Insulin was administered to

18 patients (30%), combined therapy of oral antidiabetic medication to 30 patients and oral antidiabetic drugs to 12 patients (20%).

Chart 1.1 Diabetes Treatments Used

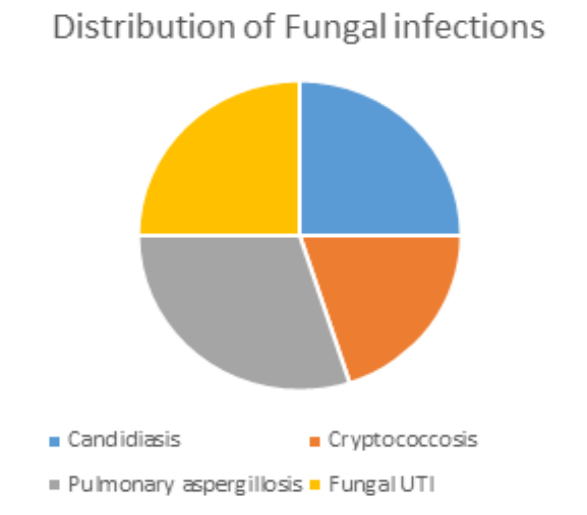


A total of 60 patients had a diabetes-induced fungal infection, where 15 patients (25%) had candidiasis, 12 patients (20%) had cryptococcosis, 18 (30%) had pulmonary aspergillosis and 15 (25%) and fungal urinary tract infection.

Figure 1.2 Fungal Infections

Fungal infections	Number of patients	Number of patients in %
candidiasis	15	25
cryptococcosis	12	20
pulmonary aspergillosis	18	30
fungal urinary tract infection	15	25

Chart 1.2 Distribution of Fungal Infections



CONCLUSION

The study was comprehensive and addressed the critical risk factors of fungal infections in patients with diabetes. Based on the review of the literature and the study findings, diabetes mellitus is a crucial risk factor for the onset of fungal infections. The study certifies that patients with diabetes are at risk of developing fungal infections, and constant check-ups for fungal infection among this population are paramount. However, the sample size is small, 60 participants, and engaged a small geographical area, KVG Medical College Hospital. This interferes with the validity and generalizability of the survey findings. Hence, although the study confirms a reliable relationship between diabetes and the onset of fungal infections, further studies engaging a larger sample size and patients from diverse geographic locations are primary to enable the generalizability of the findings.

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