ORIGINAL RESEARCH PAPER

Pharmaceutical Science

A PROSPECTIVE STUDY ON PREVALENCE AND MANAGEMENT OF OPPORTUNISTIC FUNGAL INFECTION IN HIV INDIVIDUALS

KEY WORDS:

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ABSTRACT

This study presents an in-depth evaluation of 307 HIV-infected individuals, integrating global and national HIV perspectives with localized clinical data. The Introduction outlines the virology, epidemiology, transmission routes, and socio-cultural challenges of HIV, particularly in the Indian context. The Results and Discussion further elaborate on the clinical and demographic findings. Among the 307 participants, females constituted 61%, and the 40–49-year age group was the most affected. Most individuals were from labor- intensive occupations, indicating economic hardships. A key finding was the high prevalence of mycosis (44%), with Tenia and Candidiasis being the most common fungal infections, slightly more prevalent in females. ASocial habit analysis showed low rates of smoking and alcohol, but allergies were more common, and comorbidities such as type-2 diabetes and hypertension were present but not widespread. These findings point to the necessity of strengthening follow-up care, improving access to Antifungal Therapies, and addressing underlying factors such as stigma, limited healthcare infrastructure, and poor nutrition that continue to challenge effective HIV management in real-world scenario.

INTRODUCTION

Fungal infections are major opportunistic complications in advanced HIV [1]. Pneumocystis jirovecii causes severe pneumonia, while Cryptococcus neoformans leads to fatal meningitis. Dimorphic fungi like Histoplasma capsulatum and Talaromyces marneffei cause disseminated disease in endemic regions [2]. Antiretroviral therapy (ART) has reduced systemic mycoses in high-resource settings, but Sub-Saharan Africa still reports high burdens due to delayed diagnosis and retention failures [3]. Rapid diagnostics and antifungal availability are crucial. Mucosal Candidiasis remains common but often responds to azoles. Invasive Aspergillosis, though rare, is life-threatening [4]. Screening with Cryptococcal Antigen and pre-emptive Fluconazole lowers mortality [5, 18]. Histoplasmosis, often misdiagnosed as tuberculosis, is fatal if untreated [6, 11]. Early detection improves prognosis. Global strategies must prioritize education, diagnostics, and therapy access to reduce fungal disease mortality [7, 17].

Opportunistic fungal infections are significant contributors to illness and death among people living with advanced HIV [8, 15]. Due to weakened immunity, patients are highly susceptible to fungal pathogens like Candida species, Pneumocystis jirovecii, Cryptococcus neoformans, Histoplasma capsulatum, Talaromyces marneffei and Tenia species [9, 16]. These infections can affect the lungs, central nervous system, and multiple organs, often leading to life-threatening conditions [10, 12]. Although the incidence has declined in high-resource settings due to widespread ART access, many regions still experience high rates due to late HIV diagnosis and treatment failures [13, 14]. Improving diagnostic tools, expanding antifungal therapy availability, and strengthening HIV care are critical to reducing mortality [19, 20].

Aim and Objective

- To estimate the prevalence i.e epidemiology of the fungal infection in the group of random HIV infected population of 300.
- Analyse the effective management therapy for the fungal infection in the HIV patient like ANTI FUNGAL and ANTI RETROVIRAL DRUGS.
- To analyse the relation of CD4 cell count with the progression & occurrence of the fungal infection in HIV patient.
- To identify the most common fungal pathogens affecting HIV patients.
- To evaluate the effectiveness of current antifungal treatment strategies.

Methodology

- **Study Design :** Prospective Observational Study.
- **Study Site :** ICTC Department, Government Area Hospital, Narasaraopet.
- **Study Period:** The study is proposed to conduct in period of 6 months [October 2024 to March 2025].
- **Sample Size:** 300 random HIV infected patients

Inclusion Criteria

- Adults and adoleslescents living with HIV and CD4 count
- Symptoms indicative of fungal infection -fever, cough &oral thrush, rash.
- History of previous opportunistic infections.
- Patients under ART and prophylactic therapy for fungal infection.

Exclusion Criteria

- Impaired kidney and liver functions that could contraindicate certain antifungal.
- History of severe allergic reactions to antifungal agents.
- Significant drug interactions, concurrent medication interact with antifungal.
- Uncontrolled comorbid conditions.

RESULTS

There are 134 people with the mycosis over 307 people; it defines that nearly half of the people with fungal infection. The prevalence of the opportunistic was 0.436; this means that the prevalence of the fungal infection shows that positive in HIV individuals. The given pie chart[figure-1] shows that there are 44% of people with fungal infection detected and 56% were not detected with the fungal infection , it conclude that the difference was 4% only. The percentage of male & female with mycosis. Among those female have more percentage than the male with 53% and male having 47% over the 134 patients.

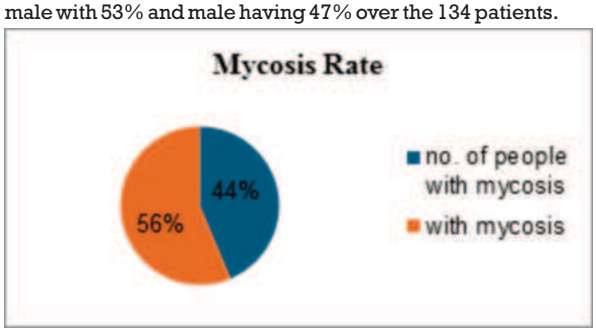

Figure -1 :The Pie Chart Shows That Mycosis Rate.

The number of people infected with the various fungal infections. In their Tenia having height number of 67 than followed by the 63 of candidias. Least detectessd by the Onychimycosis and Blastomycosis. The pie chart [figure-2] shows that most people detected with the Tenia variant of 50% than Candidias of 47%. This derives that most people infected by the Candidias and Tenia variant. This indicated that Tenia was the most common in HIV individuals than the Candidias.

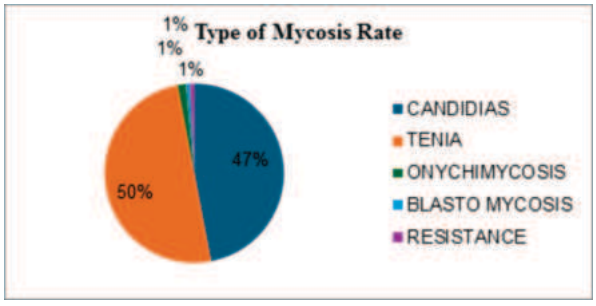

Figure -2: The Pie Chart Shows Rate of Mycosis Variant.

The bar graph [figure-3] shows the percentage of people only used ART drugs without any usage of the Antifungals are 2.60%, people who are only taken the topical anti fungal medication along with the ART drugs are 17.90%, the people who prescribed by the topical anti fungal medication & oral Antifungals along with the ART drugs are 12.70% and the people who are only given with the oral Antifungals are 10.42% for over the 307 people the remaining are not detected with the fungal infection.

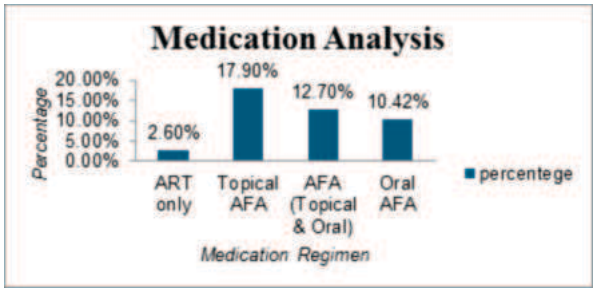

Figure -3: Medication Analysis of the Overall Subjects.

DISCUSSION

This study highlights the complex interplay between Immunosuppressant, Opportunistic infections, Pharmacological intervention, and Socio-demographic factors in HIV-positive individuals. There are 2.60% people not given any medication to the fungal infection they are managed by the diet and ART drugs. 17.91% of people was cured by the topical Anti Fungal Agents, 12.70% of people have cured by the Oral & Topical Anti Fungal Agents and 10.42% people was given by Itraconazole & Fluconazole as the prophylactic therapy. This means most people cured by the Topical Anti Fungal agents at Initial Stage, the usage of both Topical and Oral Anti Fungal Agents is necessary for the other Stages of Fungal Infections. The Prevalence of the Opportunistic Fungal Infection in HIV subjects was recorded as 0.436. This means the ratio of opportunistic fungal infection was positive; it does not dominate in the given population. There are 5% of the people have Advers Drug Reactions due to the mall nutrition. In this we have identified that people who are Flexitarian's have less detection of the fungal infection even they have abnormal CD4 cell count when compared to the other diet patterns, in this we raise that may be meat was the etiological factor to the occurrence of the fungal infection in our subjects. In the people of non vegetarians have detected with the fungal infection even they have higher and normal CD4 cell count.

CONCLUSION

Future approaches should prioritize early HIV detection and initiation of combination antiretroviral therapy (cART), with regular monitoring of CD4+ T-lymphocyte counts, as levels below 500 cells/mm^3 significantly increase susceptibility to Opportunistic fungal infections such as Candidiasis and Dermatophytosis. Profound Immunosuppression (CD4 <200 cells/mm^3) is particularly linked to invasive mycoses. Integrated management involving systemic and topical antifungal agents, tailored to immune status, is essential. Pharmacovigilance must be reinforced to monitor Adverse Drug Reactions (ADRs). Additionally, people who take more frequency of meat may contribute to fungal exposure via improper food handling or hygiene; thus, nutritional counselling and sanitation education should be incorporated into HIV care protocols.

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