

Prevalence of Opportunistic Infections and its Treatment in Patients with HIV Infection in a South Indian Tertiary Care Hospital

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ABSTRACT

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The rapid spread of Human Immunodeficiency Virus (HIV) or Acquired Immunodeficiency Syndrome (AIDS) in India is a cause for great and increasing concern. The management of opportunistic infections (OIs) is an essential component of comprehensive HIV/AIDS treatment and care. Our study is a hospital based retrospective observational study conducted on 244 HIV patients who were admitted in a South Indian tertiary care hospital during the period between January 2011-12. We retrieved required data from patient case records from the medical record department of the Antiretroviral Therapy (ART) centre and documented in a patient profile form, specifically designed for our study. The age distribution pattern inferred that the percentage of men infected with HIV was higher 148 (61%) than females 96 (39%). In the age distribution pattern the age group of 30-39 years included the highest number of patients 114 (46%), followed by the age group 40-49 years with 61 patients (25%). The most common opportunistic infections were oropharyngeal candidiasis in 92 (37.7%) patients followed by tuberculosis in 72 (29.5%). We observed adverse drug reactions like Zidovudine (AZT) induced anaemia in 21 patients (8.6%). The most widely administered combination of drugs for treating HIV was Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP) in 129 (52.8%) patients. In the treatment of OI, Co-trimoxazole was used extensively in 213 patients (87.2%), Fluconazole was used in 124 patients (50.8%) and Albendazole in 112 patients (45.9%). Anti-tubercular drugs were used in 72 patients (29.5%). Hence, in our study we found that the most commonly detected OI is oral candidiasis followed by tuberculosis in HIV patients.

Keywords: Acquired Immunodeficiency Syndrome (AIDS), Antiretroviral Therapy (ART), Opportunistic infections (OI)

INTRODUCTION

HIV is a retrovirus that infects cells of the immune system, destroying or impairing their function. The most advanced stage of HIV infection is Acquired Immunodeficiency Syndrome (AIDS) and Antiretroviral Therapy (ART) is the only effective treatment available.¹ Most untreated people infected with HIV eventually develop AIDS. These individuals mostly die from opportunistic infections or malignancies associated with the progressive failure of the immune system. The management of opportunistic infections (OIs) is an essential component of comprehensive HIV/AIDS treatment and care.^{2,3} The present scenario of HIV in India revealed this epidemic affects all of Indian society, especially groups such as sex workers, truck drivers and also children to adults, businessmen to homeless people, female sex workers to housewives and gay men to heterosexuals.⁴ The common opportunistic infections associated with AIDS in India have been tuberculosis, oropharyngeal candidiasis, Cryptosporidia causing diarrhea, Pneumocystis carinii pneumonia and Herpes infections.⁵ Due to the prevailing socio-economic conditions and poor awareness the prevalence of OI in HIV infected patients has been increasing. Early diagnosis, ART,

chemoprophylaxis and treatment of OI are important for the control of HIV replication, disease progression and ultimately containment of the epidemic.^{6,7} Hence, the aim of the present study is to assess the prevalence of OI in HIV patients, the treatment provided for OI and to observe the adverse drug reactions (ADR) of drugs used in the treatment of HIV and OI.

MATERIALS AND METHODOLOGY

Study Site: The study was conducted at tertiary care hospital, Bangalore which is a 1,000-bedded Tertiary Care referral Superspeciality Hospital, providing specialized health care services to all strata of people in and around Bangalore and also the rural population.

Study Design: A hospital based retrospective study which was conducted on 244 patients for one year from January 2011-12 where the essential data from the patient case report were documented into a self-designed patient profile form. This data was collected to review the prevalence of OI in HIV and the treatment provided.

Study Criteria:

- **Inclusion Criteria:** All adult In-patients who were treated in the ART center for OI.
- **Exclusion Criteria:** All pregnant women with HIV who have been admitted in the ART ward and patients discharged against medical advice prior to the start of treatment for OI.

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- **Source of Data:** Data was collected from the Medical Record Department of the hospital and Research Centre using a well-designed patient data collection form. The data collection form included the demographic data, chief complaint, adverse effects, past medical history and past medication history, diagnosis and treatment prescribed.
- **Statistical method:** Simple percentage calculations were conducted to arrive at the conclusion of our study. Microsoft word and Excel have been used to generate graphs and tables.

RESULTS

A retrospective study of 244 HIV patients was undertaken to study the incidence and spectrum of OI and the treatment given for the same. The study revealed that out of 244 HIV patients 148 (61%) were male and 96 (39%) were female. According to the age distribution pattern, majority of HIV patients were found in the age group of 30-39 years having a total of 114 patients (46.7%), where 68 (27.8%) were male and 46 (18.8%) were female. This was followed by the age group 40-49 years accounting to a total of 61 patients (25%) of which 34 (13.9%) were male and 27 (11%) were female and 20-29 years having 54 (22.1 %) patients consisting of 34 (13.9%) male and 20 (8.1%) female patients. Among these patients, 183 (75%) were married and 32 (13.11%) unmarried, widow(er) were 6 (2.45%) and divorced 23 (9.42%). The common opportunistic infections were oropharyngeal candidiasis 92 patients (37.7%) followed by 72 patients (29.5%) with pulmonary TB, 27 patients (11.06%) with scabies, 12 patients (4.9%) with Pneumocystis Carnii Pneumonitis (PCP) and 12 patients (4.9%) with vaginal candidiasis. Adverse drug reactions observed were Zidovudine (AZT) induced anemia in 21 patients (8.6%), followed by Pyrazinamide (Z) induced toxicity in four patients (1.6%), Stavudine toxicity in three patients (1.2%) and Efavirenz toxicity in two patients (0.8%). Most frequently used combination of ART drugs were Zidovudine

Fig. 2: Age distribution in the HIV patients in the study

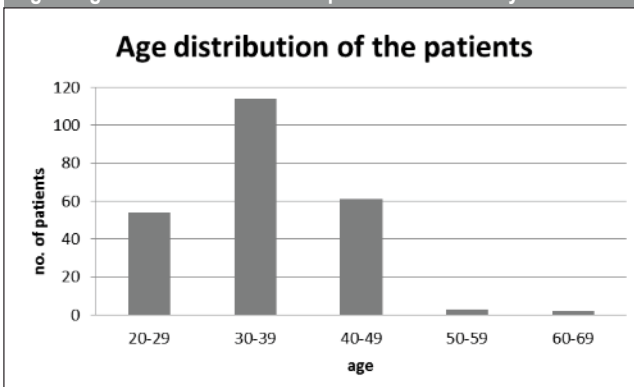


Table 1: Marital Status of patients

Marital Status	No. of Patients	%
Married	183	75
Unmarried	32	13.11
Widow(er)	6	2.45
Divorced/Seperated	23	9.42
Total	244	100.0

Fig. 3: Opportunistic infections seen in HIV patients

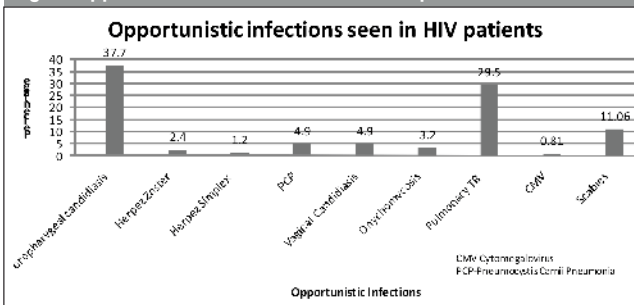


Fig. 4: ADRs observed of drugs used for treatment of HIV and OI

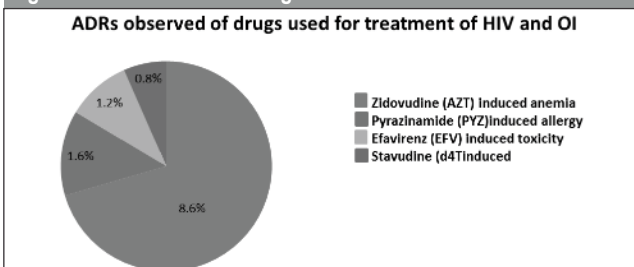


Fig. 1: Gender distribution of the HIV patients in the study

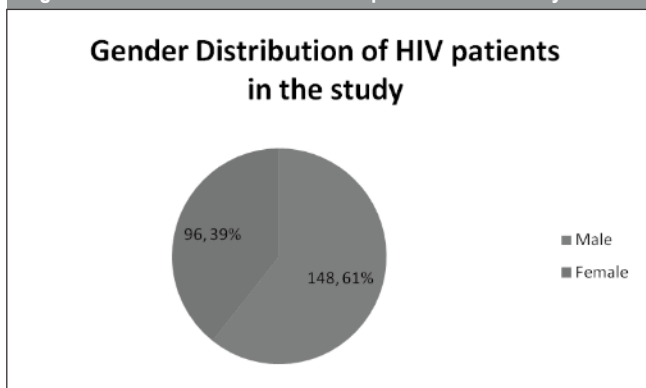
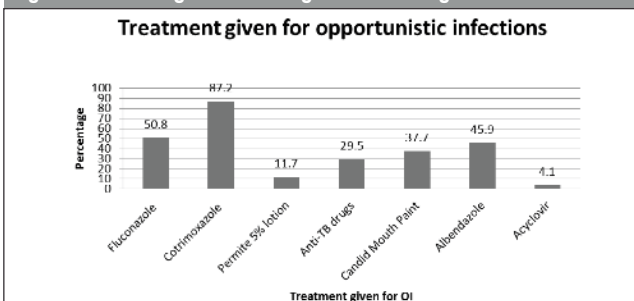


Fig. 5: Treatment given: ART regimen and Drugs for OI



(AZT) + Lamivudine (3TC) + Nevirapine (NVP) in 129 patients (52.8%), followed by the combination of Stavudine (d4T) + Lamivudine (3TC) + Efavirenz (EFV) in 56 patients (22.9%) and Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP) 46 patients (18.8%). It was observed that Cotrimoxazole (Trimethoprim TMP-Sulfamethoxazole SMX) was used extensively in 213 patients (87.2%). Fluconazole was used in 124 patients (50.8%) for treatment of oropharyngeal candidiasis, Albendazole was given as a prophylactic in 112 patients (45.9%) and Permethrin lotion 5% was used for the treatment of scabies. Anti-tubercular drugs were administered in 72 patients (29.5%).

DISCUSSION

Despite the effectiveness of prophylactic treatment for opportunistic infections and considerable success in reducing the price of the drugs in resource-poor settings, the relentless rise in OI continues to overwhelm all efforts.¹³ Our study revealed that out of 244 HIV patients 148 (61%) were male and 96 (39%) was female. This finding was supported by a study done by the World Health Organization (WHO) on Department of Gender and Women's in 2003⁹ stating that the number of males infected with HIV were greater than female. Similar results were also seen in a study on 'Gender, HIV/AIDS transmission and impacts' giving us identical conclusions on gender as above.

The opportunistic infections seen more common in our study was oropharyngeal candidiasis 92 patients (37.7%) followed by 72 patients (29.5%) with pulmonary TB, 27 patients (11.06%) with scabies, Pneumocystis Carnii Pneumonitis (PCP) and vaginal candidiasis shared the same percentage of prevalence i.e., 12 patients (4.9%) each. This finding was similar to a previous study on 'Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association, MMWR 2005' and 'CDC, Treatment of tuberculosis, MMWR 2003' where it has been noted that tuberculosis and oropharyngeal candidiasis are the most frequently occurring OI.^{11, 12} We observed adverse drug reactions (ADR) like Zidovudine (AZT) induced anemia which was reported in 21 patients (8.6%), followed by Pyrazinamide (Z) induced toxicity in four patients (1.6%) showing symptoms like hepatotoxicity, hyperuricemia, arthralgia, nausea, vomiting. Stavudine toxicity precipitating symptoms like peripheral neuropathy in three patients (1.2%) and Efavirenz toxicity including symptoms like rashes, dizziness, nausea, diarrhea, hepatitis in two patients (0.8%). These observations were identical to the ADR of drugs explained in a report by 'WHO Department of Gender and Women's Health'.¹³

We observed that the most frequently used combination of

ART drugs were Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP) in 129 patients (52.8%), followed by the combination of Stavudine (d4T) + Lamivudine (3TC) + Efavirenz (EFV) in 56 patients (22.9%) and Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP) 46 patients (18.8%). We observed the treatment pattern of OI and found that Co-trimoxazole (Trimethoprim (TMP) - Sulfamethoxazole (SMX)) was used extensively for 213 patients (87.2%). TMP-SMX is the recommended prophylactic and a dose of one double-strength tablet daily confers cross-protection against toxoplasmosis and selected common respiratory bacterial infections like PCP. The dose was 15–20 mg TMP and 75–100 mg SMX /kg/day IV administered sixth hourly to eighth hourly and was switched to oral after clinical improvement. This practice of treatment was also the recommended in the 'Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults' stating that Cotrimoxazole is the drug of choice for treatment of PCP in HIV infected¹⁴. Another epidemiological study conducted by Hardy WD, Feinberg J, Finkelstein DM, et al also stated the same inference.¹⁵

Fluconazole was used in 124 patients (50.8%) for treatment of oropharyngeal candidiasis, vulvovaginal candidiasis, onychomycosis in HIV-infected patients. Oral Fluconazole 200 mg twice daily is superior to topical therapy for with topical azoles like clotrimazole and miconazole. Albendazole was given as a prophylactic treatment in 112 patients, which is the recommended drug for initial therapy of intestinal and disseminated microsporidiosis and diarrhea caused by microsporidia. This finding was supported by a randomized double-blind controlled trial done in 1998.¹⁶ Permethrin lotion 5% was used for the treatment of scabies. Anti-tubercular drugs were administered in 72 patients (29.5%).

CONCLUSION

Our study concluded that the prevalence of OI in HIV infected patients is very high and the most prevalent OI was oral candidiasis followed by tuberculosis. It was also found that the male population were infected more than female and the age group infected most was 30–39 years. We also observed in our study that the ART drug Zidovudine induced anemia was the most evident adverse drug reaction. We also inferred from our study that there is an urgent need for education, awareness and realization of the fact that OI can be controlled by adequate personal hygiene and strict follow-ups with healthcare professionals. Health-care providers should advise HIV-infected persons about the potential risk posed by pets and also should avoid eating certain foods, including foods that might contain raw eggs, raw or undercooked poultry, meat, seafood, unpasteurized dairy products; unpasteurized fruit juice; and raw seed sprouts. Poultry and meat are safest when cooked adequately. Travel, specifically to developing

countries, might result in substantial risks of the exposure to HIV-infected persons to opportunistic pathogens, especially for patients who are severely immunosuppressed. Hence, from our study we could also infer that awareness and education about HIV infections and OI can decrease the mortality rate and increase the quality of life of the infected patients.

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