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Epidemiological Study of Opportunistic Infections in HIV Sero Positive Patients in South India

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ABSTRACT
Introduction: *Human Immunodeficiency Virus leads (HIV) to Acquired Immune Deficiency Syndrome(AIDS) and opportunistic infections (OI's) and causes increased morbidity and mortality of such patients which considerable affects quality of people living with HIV/AIDS. We therefore conducted this study to document the prevailing prevalence of opportunistic infections after initiation of highly active antiretroviral therapy in a south Indian state.*
Methods and Materials: *It is an observational study has been conducted in a tertiary Hospital, located in Warangal city of Telangana state. A total of 500 cases were collected during the study period of 6 months i.e. jan2016 to june 2016, of them 197 cases were identified with opportunistic infections.*
Results: *During this period a total of 500 cases were collected. Of them, 197 cases were presented with minimum of single opportunistic infection. Oral candidiasis and pulmonary tuberculosis were found to be more prevalent among all the conditions i.e, 25.64% and 24.78% respectively followed by peripheral neuropathy (6.41%), herpes zoster (5.98%) and upper respiratory tract infection (5.98%), diarrhea (5.56%), urinary tract infection (4.27%), pyrexia (4.70%,), pneumocystis pneumonia (3.85%).*
Conclusion: *This study is the first ever on cumulative reported data study ever on opportunistic infections among HIV/AIDS patients on active care from city of Warangal showing the real-time distribution from southern India. This will serve as a matrix for future evaluation.*
Key words: *HIV/AIDS, Opportunistic infections, Tuberculosis, Candidiasis, CD4 count.*

Introduction

HIV/AIDS remains the one of the world's most significant public health challenges, particularly in low and middle-income countries.[1] According to the UNAIDS and World Health Organization (WHO) Report 2015, there are approximately 36.7 million people living with HIV/AIDS worldwide.[2] The first case of HIV infection in India was detected in 1986,[2] and early reports suggested that the epidemic was most prevalent in female sex

workers, truck drivers, and patients attending sexually transmitted disease clinics.[4] The total number of people living with HIV/AIDS in India was estimated at around 20.9 lakh in 2011, 86% of whom were in 15-49 years age-group. Children less than 15 years of age accounted for 7% (1.45 lakh) of all infections in 2011.[5] Opportunistic infections (OIs) are a common complication of HIV infection. OIs cause substantial morbidity and hospitalization, necessitate toxic and expensive therapies and shorten the survival of people with HIV infection.[6] With a high disease burden in India,[5] it is essential to know the propitiate frequencies of specific OIs in different regions of the country, so that appropriate treatment strategies can be devised to counter them based on these data. We therefore conducted this study to document the prevailing prevalence of opportunistic infections after initiation of highly active antiretroviral therapy in a south Indian state.

Methods and Materials

It is an observational study has been conducted at Mahatma Gandhi Memorial Hospital, located in Warangal city of Telangana state. It is a1000-bed hospital which is undertaken by the government of Telangana. A total of 500 cases were collected during the study period of 6 months i.e. jan2016 to june 2016, of them 197 cases were identified with opportunistic infections.

Data collected includes demographic information such as age, sex, marital status, occupation, number of dependents, sexual preference, and HIV risk factors. HIV diagnosis was confirmed on 2 separate blood specimens by triple dot method. Laboratory data collected include CD4 count, blood count with differential, lymphocyte count, hemoglobin level, platelet count, and erythrocyte sedimentation rate. Clinical information collected includes weight, diagnosis of OIs and other HIV-related complications, prophylaxis, and other medications dispensed.

Results

Out of 197 patients 85(43.14%) were male and 112 (56.86%) were female. A total of 79(40.10%) were in the age group of 31-40 years followed by age group of 18-30 i.e, 54(27.41%), the sexually active groups. Majority of the people are from rural area i.e. 70.05% followed by urban i.e. 29.05%, with the female preponderance (40.60%) in rural area.

Educational status of most of the patients was illiterate (51.77%) followed by secondary school (18.27%), primary school (15.23%) and higher education (14.72%). A higher proportion of female subjects were illiterate (66.96%) and most of the male subjects were also illiterate (31.76%). The subjects who are working as Cooli were 39.5%, followed by employed subjects 15.23%, house wives 11.68%, agriculture 10.15%, self employed 4.57%, drivers 3.55%, others (include tailor, dhobhi, gouds, beggars) 15.23%. Among all the subjects 88.32% were under economically productive group followed by house wives 11.68%.

Most of them had good adherence to medication (i.e, >95%) 60.91% and 100% adherence in 8.12% and patients with low medication adherence were (i.e, <80%) 23.35% and 80-95% were 5.05%. 123 (62.4%) people were diagnosed as clinical sage II followed by stage III 57 (28.93%) and stage IV 17 (8.63%) and odds ratio found to be 1.031, 1.029 and 0.7187 respectively.

Oral candidiasis and pulmonary tuberculosis were found to be more prevalent among all the conditions i.e, 25.64% and 24.78% respectively followed by peripheral neuropathy, herpes zoster and upper respiratory tract infection, diarrhea, urinary tract infection, pyrexia, pneumocystis pneumonia of percentage 6.41%, 5.98% and 5.98, 5.56%, 4.27%, 4.70%, 3.85% respectively. Esophageal candidiasis lymph adenopathy, boil's, and vaginal candidiasis, dermatitis, cytomegalo virus and otitis media were less prevalent i.e, 2.14%, 2.14%, 1.28%, 0.86%, 0.43%, 0.43%, 0.43% respectively. A significant proportion of males (33.98%) suffered from pulmonary

tuberculosis when compared with female (17.55%) and also seen in conditions of Herpes zoster, Lymphadenopathy, and Diarrhea. However, the proportion of female suffering from Oral Candidiasis, esophageal Candidiasis, Urinary Tract Infection, Extra pulmonary tuberculosis was higher compared to males.

Most of the opportunistic infections were observed within 6 months of initiation of treatment followed by 1year (26.90%), 2years (14.72%), 3years (9.14%), ≥5years (7.61%), 4years (2.53%) duration of treatment. The mean duration to get first episode OI after HAART initiation is 18.52 ± 21.91 months. The mean CD4 count among these patients was found to be 386.44 ± 266.82. Among 197 patients total of 234 opportunistic infections were observed. A minimum of single opportunistic infection was seen in 154 individuals, followed by two OI in 35 individuals and more than 3 OIs were seen in 8 individuals.

Discussion

Opportunistic infections (OIs) are the major cause of morbidity and mortality in patient with HIV infection. In resource limited settings, knowledge about the prevalence of various opportunistic infections might aid in making decisions regarding empirical treatment and would help in promoting quality of life in PLWHA. In the present study 500 cases of patients living with HIV/AIDS were collected. Of them 197 subjects were diagnosed with opportunistic infections, since the initiation of ART in particular subjects.

Majority of the people were in the age group of 31-40 years (40.10%) who are sexually active and economically productive. Most of the subjects of this age group are working as cooli in different places, so they migrate to different places where they are consequently exposed to the risk of getting opportunistic infections. Similar Study by S Srirangraj et.al, Mysore Medical College and Research Institute, Mysore (2007) had reported that sexually active age group was 31-40 years age group (57.24%).[6] In the present study mean age of affected people was 37.65 ± 9.03 years. Rohit

Goel et.al, also found that mean age of patients was 36.23±8.70 which is similar to present study.[7] The main route of HIV transmission was heterosexual (97.46%). Ripunjoy sonowal et.al, [8] also found that heterosexual transmission was major route for transmission of infection i.e, 96.3%. Majority of patients in our study are from rural locations (70.05%) nearby the ART Centre. Because of less awareness of safe sex practices, illiterate rural subjects were affecting more compared to urban. A study by Jayant D Deshande et.al, also found that rural area patients are predominantly affected (56.59%). [9]

A significant number of patients were illiterate (51.77%), followed by 18.27%, who studied up to high school, 15.23% were studied up to primary school, while least number of patients were graduates 14.72%. These finding are similar to study by M.H. Usmani et.al [10] who reported that 45% were illiterates, 32% were studied up to primary school and 18% patients were educated up to high school, while least number of patients were graduates (5%). In present study female illiterates were (66.96%) more than male illiterates. Poor literacy among female may be associated with high rate of infection, because of low level of knowledge and awareness about risk factors.

The most common opportunistic infection was oral Candidiasis (25.64%) followed by pulmonary tuberculosis (24.78%), followed by peripheral neuropathy (6.41%), herpes zoster (5.98%) and upper respiratory tract infection((5.98%)), diarrhea (5.56%), urinary tract infection (4.27%), pyrexia (4.70%), pneumocystis pneumonia (3.85%). Esophageal candidiasis (2.14%), lymph adenopathy (2.14%), boils (1.28%), vaginal candidiasis (0.86%), dermatitis (0.43%), cytomegalo virus (0.43%) and otitis media (0.43%) were less prevalent.

Misha Gorantla et.al, conducted a study on "Spectrum of Chief Complaints and Opportunistic Infections among HIV Seropositive patients Attending A Community Care Centre in Nalgonda District, A.P." [11] also found that oral candidiasis

was more prevalent (18.6%), followed by Tuberculosis (1.05%), and Herpeszoser (2.6%) was similar to present study.

Candidiasis was found to be more prevalent due to poor medication adherence in 38.33% patients. The most common reasons for poor medication were a). not taking medication from ART centre on regular basis i.e, on monthly basis, as some patients can't afford to come to ART centre (where ART medication given with free of cost), b). not carrying of enough medication while traveling to distance places. c). feeling shy to come to ART centre. Most OC infected subjects are from rural area and due to unhygienic habits it was found to be widely prevalent.

Subjects with oral Candidiasis were significantly immunosuppressed (CD4 count below 500cells/μl) i.e, 62.68 % followed by 37.3% were not significantly immunosuppressed. Poor medication adherence, lack of hygiene practices and less awareness about opportunistic infection and the low CD4 count it becomes more prevalent.

The second most prevalent opportunistic is tuberculosis 24.78%. Subjects with tuberculosis were under immunosupression (64.29%) followed by 35.71% subjects were not significantly immunosuppressed and the mean CD4 count in subjects with tuberculosis was found to be 391.25 ± 255.68. The main risk factor for getting tuberculosis is low CD4count as observed in this study. Some patients who are on ART were initially adhere to medication, after that they stopped coming to ART centre for medication (due to less awareness about their disease condition) for more than 6 months (Loss of Follow Up cases) were diagnosed with tuberculosis was seen in few cases in present study and other reasons include not adherent to TB regimen duration which resulting in reoccurrence of disease and drug resistance.

First episode of OIs were observed within six months of initiation of ART in 36.55% of subjects, followed by 26.90% of subjects in 1year of initiation of treatment. Due to adverse reactions like giddiness and failure to adhere dosage regimen, and due to IRIS most of the subjects are diagnosed with opportunistic infections even after the initiation of treatment in the present study. Weerawat Manosuthi et.al, [12] found that mean duration to get first opportunistic infection was less than 3 months as similar to our study.

Conclusions

The study found that most of the affected population were from the reproductive and economical productive age group. Female preponderance with heterosexual route being the commonest mode of transmission in present study. The population with lower education and rural area were found at greater risk of infections, thus by making awareness programs about disease condition and consequences can prevent the persons getting infection. Poor medication adherence resulted in developing of opportunistic infections in many patients and thus by counseling regarding medication adherence and treatment failure consequences and scheduling of time to take medication on daily basis will make patient adherent to medication well.

Many patients suffering from more than one opportunistic infection. OI's are common within 6 months of HAART initiation as a result of IRIS and poor medication adherence. Oral Candidiasis and Pulmonary Tuberculosis were commonest opportunistic infections among the HIV seropositive patients in the present study. The mean CD4 count among patients with opportunistic infections was found to be 386.44 ± 266.82 in present study. Improved medication adherence, hygienic practices, regular examination and healthy diet can reduce the mortality and morbidity caused by opportunistic infections.

Limitations

All the determinants of prevalence OI's cannot be noted due to lack of time and resources. The CD4 count noted in the study was at the time of interview, which may vary at the time of disease condition. No diagnostic procedures were

performed to find out specific organisms for condition like oral candidasis, fever, diarrhea, oesophageal Candidiasis.

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