

Spectrum of opportunistic infections in HIV-AIDS patients

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ABSTRACT

Aim: AIDS is characterized by a number of opportunistic infections which are responsible for high morbidity and mortality. The spectrum and distribution of opportunistic infections (OIs) in AIDS patients is ever-expanding. This spectrum varies from continent to continent. The aim of the present study was to document the spectrum of OIs in HIV-infected patients in Ambajogai.

Material and Method: 178 HIV positive symptomatic patients, either hospitalized or coming to ART (Antiretroviral Therapy) centre in S.R.T.R. Medical College, Ambajogai, were included in the study for finding the spectrum of opportunistic infections.

Result: The commonest opportunistic infection seen was tuberculosis (59% of patients), followed by oral candidiasis (37.6% of patients) and parasitic diarrhea due to *Cryptosporidium parvum* (18% of patients). It was observed that out of 178 patients, maximum 53.3% were in the age group of 29-38 years followed by 21% in the age group of 39-48 years. It was found that 77% were males and 23% were females, with male to female ratio is 3.3:1.

Conclusion: This study demonstrates that tuberculosis is the commonest opportunistic infection seen in HIV patients. Clinicians should consider HIV in the differential diagnosis and management of all persons with tuberculosis.

Key words: Opportunistic Infections, tuberculosis, candidiasis, male, female

Introduction:

HIV/AIDS is spreading rapidly in India. It is estimated that in 2007, there were 2.4 million (1.8-3.2 million) people living with HIV/AIDS in India with an estimated adult HIV prevalence of 0.34% (0.25% - 0.43%). Out of the estimated number of people living with HIV/AIDS, 39% were females and 3.5% were children¹. HIV presently accounts for the highest number of deaths attributable to any single infective agent. The threat to their life is not from virus alone. Opportunistic infections (OIs) and associated complications account for considerable proportion of such mortality². The relative frequencies of specific opportunistic diseases may vary in different countries and even in different areas within the same country. The identification of such pathogen is very important for HIV and AIDS case management. As the number of AIDS patients increases in India, little information is available about the prevalence of opportunistic infections in different parts of India, considering the vastness of country³.

Many organisms responsible for opportunistic infections in such patients mimic similar clinical presentation. Early diagnosis of opportunistic infections and prompt treatment definitely contribute to increased life

expectancy among infected patients delaying the progression to AIDS. Hence the present study was carried out to find out the most common opportunistic pathogen and different opportunistic pathogens infecting HIV seropositive patients in and around Ambajogai.

Material and Methods:

The study was carried out in the Department of Microbiology at S.R.T.R. Medical College and hospital, Ambajogai from September 07 to September 09. 178 HIV positive symptomatic patients, either hospitalized or coming to ART (Antiretroviral Therapy) centre were included in the study. Their HIV status was confirmed by using three different tests (ELISA/Rapid/Simple). Necessary pre- and post-test counseling of the patients were carried out and relevant data were collected. Various specimens were collected as per symptoms and clinical presentations and were processed for different pathogens as indicated by using universal precautions.

Various samples e.g.: sputum, oral swab, blood, stool, urine, cerebrospinal fluid (CSF), lymph node aspirate were collected as per symptoms and clinical presentations under universal aseptic precautions in

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suitable sterile containers. Specimens were stained using appropriate stains eg.: Gram, Ziehl - Neelsen, Kinyons staining, and examined under microscope. Stool sample and sputum samples were stained after concentration technique. Direct saline and iodine mounts were prepared for stool sample and screened under microscope for helminthic eggs, larvae, protozoan cysts, trophozoites, pus cells and possible fungal elements. CSF samples were examined for Cryptococcus by Indian ink wet mount. Appropriate media like Blood agar, MacConkey agar, Chocolate agar, Sabourauds Dextrose agar and Lowenstein Jensen media were used for isolation of pathogens. The pathogens isolated were further identified following standard protocol.

Results:

Majority of the HIV patients were male heterosexual, by promiscuous behavior was observed to be the single most important factor. The age and sex distribution of the cases is shown in the (Table - 1). Majority of them 53.3% were in the age group of 29-38 years followed by 21% in the age group of 39-48 years. 17.4% were in the age group of 18-28 years. Thus most of the patients (91.6%) belonged to 18-48 years age group. It was found that 77% were males and 23% were females, with male to female ratio is 3.3:1. As shown in (table - 2) maximum 35.4% were labourers by occupation.

All the patients presented with more than one symptom. Various symptoms presented by these patients were fever (64.6%) followed by weight loss (57.3%), cough with expectoration (50%) and chronic diarrhoea (34.8%). Oral thrush was seen in 27% patients while headache with altered sensorium in 14.6% and 11.8% had lymphadenopathy at presentation.

In the present study, total 250 events of opportunistic infections were found comprising of bacterial, fungal and parasitic infections. A total of 105 (59.00%) patients had tuberculosis among 178 HIV seropositive cases. 62 of them had pulmonary tuberculosis and 43 had extra pulmonary tuberculosis. Candida species were isolated in 67 (37.64%) patients followed by Cryptosporidium parvum in 32 (17.98%) patients. Other infections are shown in (Table - 3).

Table No.1: Age and sex wise distribution patients (n=178)

Age group (years)	Male (%)	Female(%)	Total
20 – 30	23 (74%)	8 (26%)	31 (17.4%)
31 – 40	71 (75%)	24 (25%)	95 (53.3%)
41 – 50	31 (84%)	6 (16%)	37 (21%)
51 – 60	10 (76%)	3 (24%)	13 (7.3%)
>60	2 (100%)	0	2 (1%)
Total	137 (77%)	41 (23%)	178 (100%)

Table No.2: Pathogens isolated from 178 HIV infected patients

Opportunistic pathogens	No of patients(%)
M. Tuberculosis	105 (59%)
Candida species	67 (37.6%)
Cryptosporidium parvum	32(18%)
Klebsiella Pneumoniae	11(6.2%)
Staphylococcus aureus	5(2.8%)
Cryptococcus neoformans	5(2.8%)
Isospora belli	4(2.2%)
Strongyloidesstercoralis	3(1.7%)
Hymenolepis nana	3(1.7%)
Entamoebahistolytica	2(1.1%)
Giardia lamblia	2(1.1%)
Salmonella typhi	2(1.1%)

Discussion:

In the present study, age of the cases ranged from 18 to 65 years. Most of the patients (91.6%) belonged to 18-48 years age group. Findings of present study are in conformity with studies of Singh A et al 2003⁴, SK Sharma et al 2004⁵ and Chakravarty J et al 2006⁶, as they found 92%, 89% and 77.9% patients in age group <45 respectively.

In the present study, 77% were males and 23% were females with male to female ratio 3.3:1. Similar male preponderance was observed by studies of Kumaraswamy N et al 1995⁷, Zaheer M.S. et al 2003⁸ and Gupta V et al 2007⁹ with male female ratio 2:1, 2.42:1 and 3.64:1 respectively.

In the present study, route of transmission was found to be heterosexual in entire study group. This finding is comparable with Kumaraswamy N et al 1995⁷, Uzgare R et al 2000¹⁰, Kothari K et al 2001¹¹ and Kumar P et al 2002¹², which has also been stated heterosexual route to be the commonest route of transmission in India.

In the present study, out of 178 cases, maximum (35.4%) cases were labourers followed by housewives (20.8%), farmers (15.7%) and drivers (13.5). While 9.6% were businessmen and 5% were servicemen. Similarly N. Usha Rani et al 2000¹³, Kothari K et al 2001¹¹, Kumar P et al 2002¹² and SK Sharma et al 2004⁵ also reported labourers as the commonest personnel affected.

In the present study, housewives also formed a significant group. They acquired infection from their husbands as their husbands were also found to be HIV positive.

Low incidence in businessmen and servicemen may be because of better awareness and educational level. The present study showed, vast variations in presenting complaints of HIV positive patients with fever (64.6%) being most common followed by weight loss (57.3%). Other common presenting complaints were cough with expectoration (50%), chronic diarrhoea (34.8%), oral thrush (27%), headache with altered sensorium (14.6%) and lymphadenopathy (11.8%). Most of the patients presented with the mixed symptoms.

Findings of present study are in close conformity with the studies of Kothari K et al 2001¹¹, SK Sharma et al 2004⁵ and Gupta V et al 2007⁹, which showed fever as the most common presenting complaint found in 96%, 70.4% and 51% of patients respectively followed by weight loss in 66%, 65.2% and 43% of patients respectively.

Tuberculosis was found to be most common bacterial infection. It was seen in 59% (105/178) of patients. This finding is comparable with the studies of Biswas Jyotirmay et al 1999¹⁴, Vajpayee M et al 2003¹⁵, Singh A et al 2003⁴, Sanjeev Sinha et al 2004¹⁶ and Nilanjan Chakraborty et al 2008³, which reported tuberculosis in 50%, 47%, 56%, 47% and 57% of patients respectively. Candidiasis was found to be second most common infection seen in (37.6%) of patients. Finding of present study is in conformity, with studies of Biswas Jyotirmay et al 1999¹⁴, Kumarasamy et al 2000¹⁷, SK Sharma et al 2004⁵, and Anupriya Wadhwa et al 2007¹⁸, which showed Candidiasis in 41.4%, 45%, 39.3% and 41.7% of patients respectively. *Cryptosporidium parvum* was the commonest organism causing diarrhoea in 18% of patients. This finding is comparable with the studies of Sauda F.C. et al 1993¹⁹, Kumaraswamy N et al 1995⁷, Ghorpade M.V. et al 1996²⁰, Mohandas et al 2002²¹ and Guk S. M. et al 2005²², which showed *Cryptosporidium parvum* in 19.1%, 16%, 20%, 10.8% and 10.5% of patients respectively.

Conclusion:

There is male preponderance over female, with maximum patients from sexually active age group (18-48 years age). Hence one should focus on this age group especially male group for the prevention of high rate of HIV transmission. Tuberculosis is the most common opportunistic infection followed by Candidiasis and diarrhoea due to *Cryptosporidium parvum*.

With better knowledge and diagnosis of the opportunistic infections in HIV patients, clinicians and health planners can tackle the AIDS epidemic in a more effective manner. Specific antimicrobial prophylaxis by itself or in conjunction with antiretroviral therapy can reduce the substantial morbidity and mortality caused by opportunistic infections in patients with HIV infection. Early diagnosis of opportunistic infections and prompt treatment definitely contribute to increased life expectancy among infected patients delaying the progression to AIDS.

References:

1. K. Park, editor. AIDS. In: Park's textbook of preventive and social medicine, 20th ed, M/s Banarsidas Bhanot Publisher. 2009; P.298-310.
2. National AIDS Control Organization, Ministry of Health and Family Welfare, Govt. of India. Section 1. Introduction. In: Guidelines for prevention and management of common opportunistic infections/

- Malignancies among HIV infected Adults and Adolescents. New Delhi; 2008: P.1-3.
3. Chakraborty N, Mukherjee A, Santra S et al. Current trends of opportunistic infections among HIV-seropositive patients from Eastern India. *Jpn. J. Infect. Dis.* 2008; 61: 49-53.
 4. Singh A, Bairy I, Shivananda PG. Spectrum of opportunistic infections in AIDS cases. *Indian J Med science.* 2003; 57(1): 16-21.
 5. Sharma SK, Kadhiraan T, Banga A et al. Spectrum of clinical disease in a series of 135 hospitalized HIV-infected patients from North India. *BMC infect. Dis.* 2004; 4: 52.
 6. Chakravarty J, Mehta H, Parekh A, et al. Study on clinico-epidemiological profile of HIV patients in Eastern India. *JAPI.* Nov. 2006; 54: 854-857.
 7. Kumaraswamy N, Solomon S, Jayaker Paul SA et al. Spectrum of opportunistic infections among AIDS patients in Tamil Nadu, India. *Int J STD AIDS.* 1995; 6: 447-449.
 8. Zaheer MS, Rabbani MU, Zuber A et al. Clinical and Demographic profile of patients of AIDS in and around Aligarh. *JACM.* 2003; 4(2): 121-26.
 9. Gupta V, Singla N, Lehl S S, Chander J. Clinico-epidemiological profile of HIV infection over a period of six years in a North Indian tertiary care hospital. *IJMM.* 2007; 25(2): 171.
 10. Uzgare R. Mode of transmission of HIV in Mumbai (India) as per data collected in a private HIV/AIDS clinic. *IntConf AIDS.* 2000 Jul 9-14; 13: abstract no. TuPeC3369.
 11. Kothari K, Goyal S. Clinical profile of AIDS. *JAPI.* 2001 Apr; 49: 435-8.
 12. Kumar P, Sharma N, Sharma N C et al. Clinical profile of tuberculosis in patients with HIV infection/AIDS. *The Indian Journal of chest Diseases and Allied science.* 2002; 44(3): 159-63.
 13. Rani NU, Reddy VVR, Kumar AP et al. Clinical Profile of Pneumocystis Carinii Pneumonia In HIV Infected Persons. *Ind. Journal of tuberculosis.* 2000; 47: 93-6.
 14. Jyotirmay B, Amala J, Raizadaseemant et al. Ophthalmic manifestations of human immunodeficiency virus (HIV) infection in India. *Indian J ophthalmology.* 1999; 47: 87-93.
 15. Vajpayee M, Kanswal S, Seth P, Wig N. Spectrum of opportunistic infections and profile of CD4+ counts among AIDS patients in North India. 2003 oct; 31(5): 336-40.
 16. Sinha S, Guleria R. Spectrum of Pulmonary infections in HIV positive patients: Indian scenario. *HIV Related lung Disease.* October 27, 2004; Ref No. 109.
 17. Kumarasamy N, Solomon S, Madhivanan P et al. Dermatologic manifestations among human immunodeficiency virus patients in South India. *International Journal of Dermatology.* 2000; 39(3): 192-5.
 18. Wadhwa A, Kaur R, Agarwal SK et al. AIDS-related opportunistic mycoses seen in a tertiary care hospital in North India. *Journal of Medical Microbiology.* 2007; 56: 1101-1106.
 19. Sauda FC et al. Prevalence of Cryptosporidium species and Isospora belli among AIDS patients attending Santos Reference center for AIDS, Sao Paulo, Brazil. *J. Parasitol.* 1993; 79(3): 454-56.
 20. Ghorpade MV, Kulkarni SA, Kulkarni AG. Cryptosporidium, Isospora and strongyloides in AIDS. *Natl Med. J. India.* 1996; 9(4): 201.
 21. Mohandas, Sehgal R, Sud A, Malla N. Prevalence of intestinal parasitic pathogens in HIV-seropositive individuals in Northern India. *Jpn J.Infect.Dis.* 2002; 55(3): 83-4.
 22. Guk SM, Seo M, Park YK et al. Parasitic infections in HIV-infected patients who visited Seoul National University Hospital during the period 1995-2003. *The Korean J. Parasitol.* 2005 Mar; 43(1): 1-5.