Clinico-epidemiological profile of HIV patients attending ART centre in rural Western Maharashtra, India

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Abstract

HIV infection represents a major public health problem for both developing and developed countries as it has grown to pandemic proportions worldwide. Spectrum of clinical presentation of HIV can vary with geographical distribution, socioeconomic and cultural environment. The aim of this study was to examine the socio-demographic characteristics, clinical presentations of HIV/AIDS patients, opportunistic infections and the possible risk factors for acquiring HIV infection. A cross sectional study was conducted from March to September, 2011 at an antiretroviral therapy (ART) centre of a rural tertiary care hospital, situated in Maharashtra state of India. History and physical examination was done and recorded on a pre-designed schedule which included the socio-demographic and clinical profile of the patients. More than half of the subjects were in economically productive age group and male patients 166 (53.4%) outnumbered the female patients 145 (46.6%). There was a predominance of patients from rural locations nearby the present ART centre. The patients were having low level of literacy and were from the lower middle and lower socio-economic classes. Among the spouses of male patients, 65 (44.8%) were HIV positive and among the spouses of female patients, 52 (35.7%) were HIV positive. Commonest mode of acquiring the infection was through heterosexual contact. Tuberculosis (62%) was the most common opportunistic infection. As per the WHO staging, 132 (42.5%) patients were in stage 3. Combination of behavioral risk factors and unawareness is responsible for rapid spread of HIV/AIDS. People with high-risk behavior and spouses of affected patients need to be educated for primary and secondary prevention.

Keywords: AIDS, ART, Clinico-epidemiological profile, HIV, India.

Introduction

The human immunodeficiency virus (HIV) infection is a global pandemic. Acquired immunodeficiency syndrome (AIDS) continues to be a major global health priority. According to the UNAIDS and World Health Organization (WHO) Report 2010, there are approximately 33.3 million people living with HIV/AIDS worldwide, with a global prevalence of 0.8%.[1] The HIV cases in South and South-east Asia account for 4.1 million people with HIV.[1] It is estimated that 90% of the HIV infected persons live in the developing countries, with the estimated number of infected Indians being 2.31 million, with an adult prevalence of 0.3%.[1.] Among the Indian states, Manipur has shown the highest estimate of the adult HIV prevalence of 1.4%, followed by Andhra Pradesh (0.9%), Mizoram (0.8%), Nagaland (0.78%), Karnataka (0.63%) and Maharashtra (0.55%).[2] India launched its free national antiretroviral therapy (ART) programme in April 2004 with financial support from the Global Fund to Fight AIDS, Tuberculosis and Malaria.[3] ART has changed the face of HIV/AIDS by leading to a dramatic decrease in HIV-related morbidity and mortality among those with access to therapy.[4] ART is provided free by the government and increasing numbers of HIV-infected persons are now

Practice Points

- Most of the affected population was from reproductive age group and heterosexual route was the commonest route of transmission of HIV infection.

- Married women were found to be more vulnerable to acquire HIV infection from their husbands.

- Fever, weight loss, cough, and diarrhea were the most frequent presenting symptoms and tuberculosis was the most common opportunistic infection.

- Combination of behavioral risk factors and unawareness is responsible for rapid spread of HIV/AIDS.

- People with high-risk behavior and the spouses of affected patients need to be educated for primary and secondary prevention.

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being treated with ART in India. There is a need to study the profile of patients who come to ART centers and link their clinical and socio-demographic variables in the management of treatment. Moreover, it is important to understand the presentation of HIV disease in the local context and culture. The present study is aimed at identifying the socio-demographic characteristics, clinical presentations of HIV/AIDS patients, opportunistic infections and the possible risk factors for acquiring HIV infection at an ART centre of a rural tertiary care hospital, situated in Maharashtra state of India.

Materials and methods

A cross-sectional study was conducted at ART centre of a rural tertiary care hospital, situated in Maharashtra state of India, from March to September, 2011. This study duration was randomly selected to avoid any selection bias. The study area is in a western part of Maharashtra state. Predominantly the study population was from the rural area around Loni along with some nearby urban area like Kopargaon, Shrirampur,Sangamner, Rahuri, etc. The HIV positive patients coming to ART centre for treatment were included in the study. Their demographic details, personal history, behavioral pattern were studied. Patients with HIV infection tend to present in advanced stages of acquired immunodeficiency syndrome (AIDS) and are usually referred to the hospital's ART centre. The centre receives financial and logistic support from National AIDS Control Organization (NACO). Patients were offered antiretroviral therapy if their CD4 lymphocyte count was less than <350 cells/ microlitre (μl). If the patient is found clinically eligible, then one of the following first-line regimens is started: (i) Zidovudine (ZDV) (300 mg) +lamivudine (3TC) (150 mg)+nevirapine (NVP) (200 mg) or efavirenz (EFV) (600 mg), (ii) Stavudine (d4T) (30 mg) +3TC (150 mg)+NVP (200 mg) or EFV (600 mg). Trimethoprim-Sulphamethoxazole prophylaxis was given to prevent Pneumocystis Carinii pneumonia in all patients with a CD4 lymphocyte count of <200 cells/μl.

Data collection
In the present study out of 311 patients, the male patients 166 (53.4%) outnumbered the female patients 145 (46.6%). Male to female ratio was 1.14:1. After explaining the objectives of the study and assuring the confidentiality of the subjects, permission was obtained from the Incharge Medical Officer of the ART centre. A questionnaire was used to collect the information from the HIV positive patients on ART attending the Out Patient services at the ART centre. Prior to commencement of the study a one-week pilot study was undertaken to look for flaws in the questionnaire. Informed consent was obtained. History and physical examination was done and recorded on a pre-designed schedule which included the socio-demographic and clinical profile of the patients. All enrolled HIV positive patients were seen by the treating physician and the relevant data was collected, which included information of age, sex, socioeconomic status (SES), background, education level, occupation, religion, marital status, sexual history, clinical features, opportunistic infections, laboratory

parameters (CD4 counts). Socio-economic status was assessed by the modified BG Prasad classification based on the consumer price index.[5] The clinical staging was done according to the World Health Organization (WHO) classification of HIV/AIDS.[6] Clinical stage 1 includes asymptomatic patients. Clinical stage 2 includes minor weight loss, minor mucocutaneous manifestations, and recurrent upper respiratory tract infections. Clinical stage 3 includes weight loss >10% of body weight , unexplained chronic diarrhea, unexplained persistent fever, oral candidiasis or leukoplakia, severe bacterial infections, pulmonary tuberculosis and acute necrotizing inflammation in the mouth. Clinical stage 4 includes 22 opportunistic infections or cancers related to HIV. All people with stage 4 have AIDS.[6] Data was processed and analyzed with SPSS version 17.0. The demographic and opportunistic infections data were expressed in percentages. Chi square (χ^2) test was used as test of significance. A *p*-value ≤0.05 was considered statistically significant.

Result

The distribution of patients according to the age showed that, the maximum number of males 128 (77.1%) as well as females 122 (84.1%) were in the age group of 15 -45 years. Maximum patients i.e. 176 (56.6%) were residing in rural area while 135 (43.4%) in urban area. There was a predominance of patients from rural locations nearby the present ART centre as 33 (10.6%) patients lived less than 10 km from centre, 190 (61.1%) 11 -30 km and 50 (16.1%) 31-50 km. In the present study, out of 311 patients, 81 (26.1%) were illiterate while 230 (74%) were literate. Maximum numbers of females were illiterate (39.3%) as compared to males (14.5%). Among the patients studied 222 (71.4%) were married. Almost one third of the females i.e. 49 (33.8%) were widow. The patients were from the lower middle and lower socio-economic classes (Table 1). Most of them were working as laborers/farmer (55%), housewife (14.2%) and drivers (4.8%). Laborers include the agricultural as well as nonagricultural laborers. There was no statistical difference in the socio-demographic parameters like age (χ^2=3.83; Degrees of freedom (d.f.) =2, *p*=0.14); Socioeconomic status (χ^2=6.6; d.f.=4, *p*=0.15); and place of residence (χ^2= 0.19; d.f.=1 *p*=0.65) amongst the male and the female patients There was statistical significant difference in the socio-demographic parameters like educational status (χ^2=33.52; d.f=3, *p*=0.000) and marital status (χ^2=61; d.f.=1, *p*=0.000).

The most common presenting complaints were weight loss, fever, cough, and chronic diarrhea (Table 2). HIV status of 145 (46.6%) spouses was known. Among the spouses of male patients 65 (44.8%) were HIV positive and among the spouses of female patients 52 (35.9%) were HIV positive. As expected majority of the patients belonged to the sexually active age group of 20 to 40 years, commonest mode of acquiring the infection was through heterosexual contact and 19 (6.1%) patients acquired infection via vertical (mother to child) transmission. None of the patients gave a history of drug

Table 1: Socio-demographic profile of HIV positive patients

	Male n-166 (53.38%)	Female (%) n-145 (46.62%)	Total n-311
Age(years)			
< 15	12 (7.22%)	4 (2.75%)	16 (5.14%)
15-45	128 (77.1%)	122 (84.13)	250 (80.38)
>45	26 (15.66%)	19 (13.1)	45(14.46)
Education			
Illiterate	24 (14.45%)	57 (39.31%)	81 (26.05%)
Primary	39 (23.51%)	25 (17.24%)	64 (20.58%)
Secondary	83 (50%)	61 (42.06%)	144 (46.30%)
Higher secondary and above	20 (12.04%)	2 (1.37%)	22 (7.07%)
Socioeconomic status			
I	16 (9.63%)	4 (2.75%)	20 (6.43%)
II	64 (38.55%)	57 (39.31%)	121 (38.92%)
III	72 (43.37%)	73 (50.34%)	145 (46.62%)
IV	8 (4.81%)	6 (4.13%)	14 (4.50%)
V	6 (3.61%)	5 (3.44%)	11 (3.53%)
Marital status			
Unmarried	29 (17.46%)	8 (5.51%)	37 (11.89%)
Married	134 (80.72%)	88 (60.68%)	222 (71.38%)
Widow/widower	3 (1.8%)	49 (33.79%)	52 (16.72%)
Residence			
Rural	92 (55.42%)	84 (57.93%)	176 (56.59%)
Urban	74 (44.58%)	61 (42.07%)	135 (43.41%)

abuse or homosexual behavior in present study. Out of the 311 patients, 147 (47.3%) were on ZDV+3TC+NVP combination and 98 (31.5%) were on d4T+TC+NVP (Table 3).

Tuberculosis (62%) was the most common opportunistic infection. Other presentations like pneumosystis carinii pneumonia, herpes zoster, malignancy, candidiasis, neurological disorders and ophthalmic manifestations were noted. As the number of CD4 count decreased, incidence and the number of opportunistic infections per patient increased. As per the WHO staging[4], 132 (42.5%) patients were in stage 3 (Table 4).

Discussion

The epidemic of HIV/AIDS in India is shifting from the highest risk group (commercial sex workers, drug users) to bridge population (clients of sex workers, STD patients and partners of drug users) and then to general population. In present study, more than half of the subjects were in economically productive age group and majority of patients who sought ART were males. In a study done by Mandal *et al.*,[7] 81.16% of cases were in the age group of 20-40 years with male to female ratio of 1.5:1 HIV seems to be affecting the economically productive, sexually active group and thus having a tremendous impact on the livelihood of the affected family. The distribution according to educational status showed that the seropositivity was higher among the subjects with lesser education. These findings are similar to the study conducted by Jayaram *et al.*[8] in Karnataka, India. Low education status and less awareness regarding safe sex can be the reason for high prevalence among this group of people. Most of the patients in present study were from the lower-middle and lower socio-

Table 2: Presenting complaints of patients attending ART centre*

Complaints	Male n-166 (%)	Female n-145 (%)	Total n-311(%)
Weight loss	128 (77.10%)	98 (67.58%)	226 (72.66%)
Chronic fever	75 (45.18%)	88 (60.68%)	163 (52.41%)
Cough	58 (34.93%)	48 (33.10%)	106 (34.08%)
Body pain	34 (20.48%)	68 (46.89%)	102 (32.15%)
Fatigue	42 (25.30%)	58 (40.00%)	100 (32.79%)
Chronic diarrhea	54 (32.53%)	44 (30.34%)	98(31.51%)
Malaise	38 (22.89%)	42 (28.96%)	80 (25.72%)
Breathlessness	25 (15.06%)	07 (4.82%)	32 (10.28%)
Lymphadenopathy	18 (10.84%)	12 (8.27%)	30 (9.64%)
Generalized pruritic dermatitis	2 (1.20%)	1 (0.68%)	3 (0.96%)

*Multiple responses

Table 3: Clinical profile of patients attending ART centre

Clinical profile	Number (%)
Family history	
Husband positive	52 (35.86%)
Wife positive	65 (44.82%)
Parents positive	18 (12.42%)
Child/children positive	10 (6.89%)
Total	145
Routes of transmission of HIV infection	
Heterosexual	287 (92.28%)
Mother to child	19 (6.11%)
Blood transfusion	5 (1.61%)
Intravenous drug abuse	0
Homosexual	0
ART Regimes	
Zidovudine + Lamivudine + Nevirapine	147 (47.26%)
Stavudine + Lamivudine + Nevirapine	98 (31.51%)
Stavudine + Lamivudine + Efavirenz	34 (10.95%)
Zidovudindine + Lamivudine + Efavirenz	32 (10.28%)

economic classes and were working as laborers/farmer, housewives and drivers. Mandal *et al.*[7] found that the main risk groups were truck drivers and laborers. Most of the females i.e. 49 (33.8%) were widow. Most of the widows gave history of death of their husbands due to HIV/AIDS. The reason for more number of attendees those were housewife can be gaining of infection by unsafe sex from their HIV positive husband or any other sexual partner. This point-out the unsafe sexual practices among married couple. There was a predominance of patients from rural locations nearby the present ART centre. This type of distribution in the present study might be due to the rural location of ART centre, easier access by the rural people or it might indicate real increase in the HIV prevalence in the rural areas of the district.

The major manifestations of HIV/AIDS, reported in this study namely: weight loss, chronic fever and diarrhea are comparable with previous reports.[9,10] Though numerous other studies have reported about some other complaints like problem in conception[11], fertility[12] and neurological disorders.[13] In this study, heterosexual mode of transmission was the major mode of transmission in 92.3% of the cases. Sexual, especially the heterosexual, transmission is the main driver of the epidemic in most of India. Kothari *et al.*[14] showed that heterosexuality accounted for 90% of the total cases. Tuberculosis (62%) was the most common opportunistic infection in present study. In India, the most common opportunistic infection among people with HIV infection is pulmonary tuberculosis.[15-17] The rates of HIV/TB co-infection have been reported to vary in different regions of India. In North India, it was found to be between 0.4 and 20.1%.[18] Low level of immunity makes them susceptible to fresh TB infection or reactivation of latent infection. The risk of developing TB after an infectious contact is 5-10% per year among HIV infected individuals compared to 5-10% per cent during the lifetime of HIV-negative individuals.[19]

CD4 count is one of most reliable investigation for clinical staging of patients and used to make decision on treatment initiation along with opportunistic infections. The prolonged course of HIV infection is marked by a decrease in the number of circulating CD4+ T helper cells and persistent viral replication, resulting in immunologic decline and death from opportunistic infections and neoplasms.[20] Majority of patients presented with an initial CD4 count of less than 300cells/ µl consistent to previous study.[21] In present study ZDV+3TC+NVP and d4T+3TC+NVP combination was prescribed to 47.3% and 31.5% patients respectively. In a study by Bachani *et al.*,[22] 71% of patients were started on d4T+3TC+NVP and ZDV+3TC+NVP was prescribed to 28% of the patients. Though, ART does not cure HIV/AIDS, but effective ART regimens inhibit the efficient replication of the HIV virus, and reduce viremia. HIV-infected patients with CD4 counts <200 cells/mm3 are at higher risk of opportunistic diseases, non-AIDS morbidity, and death than HIV-infected patients with higher CD4 counts. Randomized controlled trials in patients with CD4 counts <200 cells/µl and/or a history of an AIDS-defining condition provide strong evidence that ART improves survival and delays disease progression in these patients.[23,24]

The study has a number of limitations. This study was conducted at an ART centre of a rural tertiary care hospital in Maharashtra state of India, therefore, caution needs to be taken to generalize the findings. Moreover, as this is a cross-sectional study, associations have been established among variables but not the casual inferences. A gap still exists between those detected as HIV-positives and those who report on ART centre.

Conclusion

The study found that most of the affected population was from reproductive age group and male preponderance with heterosexual route being the commonest mode of transmission. Married women were found to be more vulnerable to acquire HIV infection from their husbands. Fever, weight loss, cough, and diarrhea were the most frequent presenting symptoms and tuberculosis was the most common opportunistic infection. Combination of behavioral risk factors and unawareness is responsible for rapid spread of HIV/AIDS. People with high-risk behavior and the spouses of affected patients need to be educated for primary and secondary prevention.

Acknowledgement

Table 4: Opportunistic infections, CD4 Cell count and WHO clinical staging

	Male (%)	Female (%)	Total (%)
Opportunistic infections			
Tuberculosis	46 (63.88%)	21 (58.33%)	67 (62.03%)
Pneumonia	7 (9.72%)	5 (13.88%)	12 (11.11%)
Malignancy	5 (6.94%)	4 (11.11%)	9 (8.33%)
Herpes zoster	6 (8.33%)	2 (5.55%)	8 (7.45%)
Eye disorder	4 (5.55%)	3 (8.33%)	7 (6.39%)
Candidiasis	2 (2.77%)	1 (2.77%)	3 (2.77%)
Neurological	2 (2.77%)	0	2 (1.86%)
Total	72 (66.66%)	36 (33.34%)	108 (100%)
HIV -TB			
Pulmonary	35 (21.08%)	14 (9.65%)	49 (15.75%)
Extra pulmonary	3 (1.80%)	2 (1.37%)	5 (1.60%)
Both	8 (4.81%)	5 (3.44%)	13 (4.18%)
Not having TB	120 (72.28%)	124 (85.51%)	244 (78.45%)
Total	166 (53.38%)	145(46.62%)	311 (100%)
CD4 Cell count (cells/µl)			
≤50	18 (10.84%)	12 (8.27%)	30 (9.60%)
51 – 100	25 (15.06%)	28 (19.31%)	53 (17.04%)
101 – 150	26 (15.66%)	20 (13.79%)	46 (14.70%)
151 – 200	34 (20.49%)	29 (20%)	63 (20.65%)
201 – 250	23 (13.85%)	27 (18.62%)	50 (16.09%)
251 – 300	8 (4.81%)	7 (4.82%)	15 (4.60%)
301 – 350	11 (6.63%)	8 (5.51%)	19 (6.10%)
Above 350	21 (12.65%)	14 (9.65%)	35 (11.25%)
Total	166 (53.38%)	145(46.62%)	311 (100%)
WHO clinical staging			
Stage 1	29 (17.47%)	25 (17.24%)	54 (17.36%)
Stage 2	59 (35.54%)	54 (37.24%)	113 (36.33%)
Stage 3	71 (42.77%)	61 (42.07%)	132 (42.45%)
Stage 4	7 (4.21%)	5 (3.45%)	12 (3.85%)
Total	166 (53.38%)	145 (46.62%)	311 (100%)

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