## **Original Research Article**

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20173632

# Clinico-demographic profile of HIV patients at ART centre of a tertiary care referral hospital in North India

Rashmi Kumari<sup>1</sup>\*, Mritunjay Kumar<sup>2</sup>, S. C. Mohapatra<sup>3</sup>

Received: 12 July 2017 Accepted: 28 July 2017

## \*Correspondence: Dr. Rashmi Kumari,

E-mail: rashmidmch2k@gmail.com

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#### **ABSTRACT**

**Background:** According to the National AIDS Control Organization (NACO), HIV prevalence in India is 0.36% and people living with HIV are around 2.47 million. Although antiretroviral treatment (ART) does not cure HIV/AIDS, but effective ART regimens inhibit the efficient replication of the HIV virus, and reduce viremia to undetectable levels.

**Methods:** HIV positive patients qualified to be enrolled in to the study were those who attended the infectious diseases clinic at least twice (one follow-up visit at least six months apart), between January 2009 to December 2011. The protocol was approved by the Ethical Committee of the IMS, BHU. History and detail of patients were recorded on a pre-designed performa which included the socio-demographic profile of the patients, mode of transmission, presenting symptoms, opportunistic infections and many others.

**Results:** 5308 HIV positive patients were registered during three year of study period at the ART Centre of IMS, BHU. Of these 3379 (63.7%) were males and 1929 (36.3%) were females. Heterosexual mode of transmission was commonest in the study group and amounted to 70.5% of total HIV patients on ART. Pulmonary tuberculosis was most common opportunistic infection and was present in 1045(19.7%) of patients on ART. CD4 counts of the patients were significantly inversely correlated with the number of symptoms and the number of opportunistic infections.

**Conclusions:** HIV infection is one of the major infectious diseases in this part of India, and being chronic and lifelong in nature, its impact is huge compared to other infectious diseases. People with high risk behavior and the spouse of the affected couple need to be educated for primary and secondary prevention of the disease.

Keywords: Demographic, ART, HIV, CD4, Opportunistic

## INTRODUCTION

Acquired immune-deficiency syndrome (AIDS) is a fatal illness caused by a retrovirus known as the human immune deficiency virus (HIV) which breaks down the body's immune system, leaving the victim vulnerable to a host of life threating opportunistic infections, or neurological disorders, or unusual malignancies. The human immunodeficiency virus (HIV) infection is a

global pandemic and presents serious public health problems in the developing countries, especially in India. According to the UNAIDS and World Health Organization (WHO) reports of November 2010, 33.3 million people are living with HIV/AIDS worldwide with a global prevalence of 0.8%<sup>1</sup>. It is now the leading cause of adult deaths in the world due to infectious disease.<sup>2</sup> In spite of the improved access to antiretroviral treatment (ART) and care in many regions of the world, AIDS has

<sup>&</sup>lt;sup>1</sup>Department of Community Medicine, <sup>2</sup>Department of Pediatrics, SGRR Institute of Medical & Health Sciences, Dehradun, Uttarakhand, India

<sup>&</sup>lt;sup>3</sup>Department of Medicine and Health Sciences, SGT University, Gurgaon, Haryana, India

killed millions of people.<sup>3</sup> 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. HIV/AIDS is not only a public health issue in India but one of the most serious socio-economic & developmental concerns, because nearly 89% of reported cases are occurring in sexually active and economically productive age group (15-44 yrs). Deaths of young adults have an especially damaging impact on their families and communities.<sup>4</sup> Though, ART does not cure HIV/AIDS, but effective ART regimens inhibit the efficient replication of the HIV virus, and reduce viremia to undetectable levels. This leads to slowing of disease progression and fewer opportunistic infections and helps people lead more productive lives, with perceptibly reduced stigma and discrimination. Successes achieved by ART in terms of delaying the onset of AIDS have transformed the common perception about HIV from being a "virtual death sentence" to a "chronic manageable illness". Appropriate management of opportunistic infections (OI) is as important as antiretroviral therapy (ART) in preventing mortality and morbidity among HIV-infected persons. The incidence of OI depends on the level of immune suppression (occurring at CD4 cell counts of <200/mm<sup>3</sup> or total lymphocyte count <1200/mm<sup>3</sup>), and on the endemic prevalence of the causative agent. Early diagnosis, antiretroviral therapy, chemo-prophylaxis, and treatment of opportunistic infections are important for the control of HIV replication, disease progression and ultimately containment of the epidemic. 6 This study focuses upon the natural history of the acquisition of the disease, clinical profile and the spectrum of opportunistic infections from the Eastern part of North India.

## **METHODS**

This study was conducted at Sir Sunderlal Hospital of Institute of Medical Sciences, Banaras Hindu University, Varanasi, in the state of Uttar Pradesh. It is a center of Excellence and drains patients from five big states of India namely Uttar Pradesh, Bihar, MP, Jharkhand and Chhattisgarh. It was a cross-sectional study conducted at ART center of a tertiary care referral hospital at Varanasi. HIV positive patients qualified to be enrolled in the study were those who attended the infectious diseases clinic at least twice (one follow-up visit at least six months apart), from January 2009 to December 2011. The protocol was approved by the Ethical Committee of the Institute of Medical Sciences, Banaras Hindu University, Varanasi. After obtaining informed consent, a semi-structured Questionnaire was administered to adult HIV patients attending ART centers, Varanasi. Their demographic details, personal history, behavioral pattern were studied during the study period. Diagnosis of HIV was confirmed by ELISA using two different antigens and a rapid test as recommended by National AIDS Control Organization (NACO). After confirmation of HIV infection at ICTC center in the department of Microbiology, CD4 count was done. CD4 lymphocyte counts were determined by FACS Count (Becton Dickinson). Specific opportunistic infections were diagnosed on the basis of standard

clinical definitions and laboratory procedures. Patients presenting in the advanced stages of aquired immunodeficiency syndrome (AIDS) were referred to the hospital's ART centre. The centre receives financial and logistic support from National AIDS Control Organizational (NACO).

Patients were offered antiretroviral therapy if their CD4 lymphocyte count was less than <350 cells/ml. Trimethoprim-Sulphamethoxazole prophylaxis was given to prevent *Pneumocystis carini* pneumonia in all patients with a CD4 lymphocyte count of <200 cells/ml. The patients were followed up every 3-6 months during which their weight, hemoglobin level and CD4 lymphocyte count were determined. Data was entered and analyzed using a statistical software package (SPSS for windows, version 20, SPSS).

#### **RESULTS**

In the present study out of 5308 patients, the male patients (63.7%) outnumbered the females (36.3%). Male to Female ratio was found to be 1.75:1. The low numbers of female was not a true representation of the proportion of females probably due to financial constraints, gender bias and social stigma attached with the disease. During the 3 year study period, trends were almost similar with the sexes. The positivity rate among males was significantly higher as compared to females at ART centre and was statistically significant (p<0.05) (Table 1). 2592 (48.8%) patients were in the age group of 35-49 yrs followed by 1682 (31.7%) patients who were in the age group of 25 -34 yrs. Out of total HIV positive patients on ART, 3793 (71.5%) were married, whereas remaining 1076 (20.3%) and 426 (8.0%) were widow and unmarried respectively. It clearly shows that married were more sufferers during three year of study period. The differences were statistically significant p<0.00 (Table 1).

1923 (36.2%) patients were illiterate while 1853 (34.9%) were educated up to secondary school. 1238 (34.9%) were educated up to Primary and only 294 (5.5%) were educated up to college level. Majority of patients on ART were not related to any particular occupation and they constituted about 81.8% of cases (Table 1). There was statistical significant difference in the socio-demographic parameters like educational status ( $\chi^2$ =45.93; df=6, p<0.001) and marital status ( $\chi^2$ =11.84; df=5; p<0.05). Heterosexuality was the most common mode of transmission in the study group and amounted to 70.5% of total HIV patients on ART. Mother to child transmission was responsible for 5.3%, blood transfusion was responsible for 2.4%. Injection and homosexuality were minor risk factors and responsible for 0.3% and 0.5% of HIV patients on ART respectively (Table 2).

Out of total 5308 HIV +ve patients, maximum 2455 (46.3%) were referred from integrated counseling and testing centre (ICTC) and 123 (2.3%) of patients were referred from Prevention of parent to child transmission (PPTCT) centre. 771 (14.5%) HIV patients were referred from other departments of S.S. Hospital (inpatients) and

612 (11.5%) were referred from private practitioners. It was also observed that only 738 (13.9%) patients voluntarily came to ART centre without any reference. The difference was statistically significant ( $\chi^2$ =469.3, df=14, p<0.001). About 84 (1.6%) patients were from people living with HIV/AIDS (PLHA) network (Sonebhadra, Chandauli, Mirzapur). 1755 (33.1%) patients had opportunistic infections (OIs) at the time of their first presentation in the clinic. The mean CD4 counts in the patients without OI and with at least one OI were 264 and 176 cells/µl respectively. There was a progressive and highly significant inverse relationship between the CD4 count with the increasing number of

OIs (p<0.001) (Table 3). Pulmonary Tuberculosis (19.7%) was the most common opportunistic infection, followed by Extra-pulmonary (12.6%) and Pulmonary + extra-pulmonary (0.6%) (Table 4). After confirmation of HIV infection at the ICTC center in the department of Microbiology of the institute, CD<sub>4</sub> count was done. CD<sub>4</sub> lymphocyte counts were determined by FACS Count (Becton Dickinson). Specific opportunistic infections were diagnosed on the basis of standard clinical definitions and laboratory procedures. Chemoprophylaxis and antiretroviral therapy was advised as indicated. Viral load estimation was not done because of the financial constraints.

Table 1: Socio-demographic profile of HIV positive patient.

	Years			
	2009	2010	2011	Total
	N (%)	N (%)	N (%)	N (%)
Age groups (in years)				
<14	83 (5.5)	94 (5.0)	107 (5.5)	284 (5.4)
15-24	59 (3.9)	88 (4.7)	91 (4.7)	238 (4.5)
25-34	493 (32.7)	594 (31.8)	595 (30.8)	1682 (31.7)
35-49	729 (48.3)	919 (49.2)	944 (48.8)	2592 (48.8)
>50	144 (9.5)	171 (9.2)	197 (10.2)	512 (9.6)
Sex				
Male	972 (64.5)	1218 (65.3)	1189 (61.5)	3379 (63.7)
Female	536 (35.5)	648 (34.7)	745 (38.5)	1929 (36.3)
Marital status				
Married	1119 (74.2)	1322 (70.8)	1352 (69.9)	3793 (71.5)
Single	102 (6.8)	148 (7.9)	176 (9.1)	426 (8.0)
Divorced	5 (0.3)	5 (0.3)	3 (0.2)	13 (0.2)
Widowed	282 (18.7)	391 (21.0)	403 (20.8)	1076 (20.3)
Educational status				
Illiterate	544 (36.1)	678 (36.3)	701 (36.2)	1923 (36.2)
Primary	306 (20.3)	398 (21.3)	534 (27.6)	1238 (23.4)
Secondary	562 (37.3)	702 (37.6)	589 (30.5)	1853 (34.9)
Higher sec. and above	96 (6.3)	88 (4.8)	110 (5.7)	294 (5.5)
Occupational status				
Skilled	39 (2.6)	74 (4.0)	275 (14.2)	388 (7.3)
Unskilled	15 (1.0)	2 (0.2)	342 (17.7)	359 (6.8)
Driver	7 (0.5)	11 (0.6)	127 (6.6)	145 (2.7)
Government employee	6 (0.4)	3 (0.2)	39 (2.0)	48 (0.9)
Sex-worker	2 (0.1)	1 (0.1)	7 (0.4)	10 (0.2)
Student	0 (0.0)	0 (0.0)	17 (0.9)	17 (0.3)
Housewife	1439 (95.4)	1776 (95.2)	1126 (58.2)	4340 (81.8)

Table 2: Distribution of mode of transmission of HIV in Patients at ART centre.

	Years	■ Total		
Mode of transmission	2009	2010	2011	Total
	N (%)	N (%)	N (%)	N (%)
Heterosexual	1008 (66.8)	1293 (69.3)	1443 (74.6)	3744 (70.5)
MSM	4 (0.3)	7 (0.4)	15 (0.8)	26 (0.5)
Injecting drug use (IDU)	3 (0.2)	10 (0.5)	5 (0.3)	18 (0.3)
Blood transfusion	49 (3.2)	45 (2.4)	31 (1.6)	125 (2.4)
Mother to child (MTC)	78 (5.2)	94 (5.0)	111 (5.7)	283 (5.3)
Probable unsafe injection (PUI)	51 (3.4)	55 (2.9)	74 (3.8)	180 (3.4)
Unknown (UN)	315 (20.9)	362 (19.4)	255 (13.2)	932 (17.6)

Table 3: Distribution of referrals system of HIV patients at ART Centre.

	Years			
Entry Point	2009	2010	2011	Total
	N (%)	N (%)	N (%)	N (%)
ICTC	509 (33.8)	844 (45.2)	1102 (57.0)	2455 (46.3)
Outpatient	118 (7.8)	105 (5.6)	77 (4.0)	300 (5.7)
Inpatient	162 (10.7)	285 (15.3)	324 (16.8)	771 (14.5)
PPTCT	9 (0.6)	42 (2.3)	72 (3.7)	123 (2.3)
Private Practioner	316 (21.0)	184 (9.9)	112 (5.8)	612 (11.5)
Others-NGOs	52 (3.4)	105 (5.6)	68 (3.5)	225 (4.2)
Self-referred	307 (20.4)	266 (14.3)	165 (8.5)	738 (13.9)
PLHA network	35 (2.3)	35 (1.9)	14 (0.7)	84 (1.6)

Table 4: Clinical profile of patients attending ART Centre.

	Years			
	2009	2010	2011	Total
	N (%)	N (%)	N (%)	N (%)
Hemoglobin levels (gm/dl)				
<5	42 (2.8)	18 (1.1)	5 (0.3)	65 (1.3)
5-10	779 (52.8)	467 (29.2)	342 (1 8.3)	1588 (32.1)
10-15	640 (43.4)	1101 (68.8)	1512 (80.9)	3253 (65.8)
>15	14 (0.9)	14 (0.9)	9 (0.5)	36 (0.7)
Opportunistic infection				
Pulmonary TB	347 (23.00	380 (20.4)	318 (16.4)	1045 (19.7)
Extra-pulmonary TB	210 (13.9)	242 (13.0)	218 (11.3)	670 (12.6)
Pulmonary + Extra-pulmonary TB	12 (0.8)	18 (1.0)	2 (0.1)	32 (0.6)
Past history of TB	0 (0.0)	1 (0.1)	7 (0.4)	8 (0.2)
No infection	939 (62.5)	1225 (65.6)	1389 (71.8)	3553 (66.90
Category of CD <sub>4</sub> count				
< 50	208 (13.8)	289 (15.6)	294 (15.2)	791 (14.9)
50-250	1119 (74.3)	1305 (70.3)	1259 (65.3)	3683 (69.6)
250-400	126 (8.4)	183 (9.9)	293 (15.2)	602 (11.4)
400-650	39 (2.6)	64 (3.4)	57 (3.0)	160 (3.0)
>650	15 (1.0)	15 (0.8)	25 (1.3)	55 (1.0)

Table 5: Status of CD<sub>4</sub> count and weight of HIV patients during initial and 6 months.

	No.	Minimum	Maximum	Mean±S.D.
CD <sub>4</sub> count (cells/mm <sup>3</sup> )				
At initial stage	5291	0	999	166.26±124.832
After 6 months	3014	4	988	319.16±162.060
Weight (kg)				
At initial stage	5205	4	90	42.95±11.478
After 6 months	2923	7	94	46.51±12.068

Patients were offered antiretroviral therapy if their CD4 lymphocyte count was less than <350 cells/ml. Trimethoprim-Sulphamethoxazole prophylaxis was given to prevent *Pneumocystis carini* pneumonia in all patients with a CD<sub>4</sub> lymphocyte count of <200 cells/ml. The patients were followed up every 3-6 months during which their weight, hemoglobin level and CD<sub>4</sub> lymphocyte count were determined.

The mean  $CD_4$  count of at initial stage was  $166.26\pm124.83$  and after 6 months it was  $319.16\pm162.06$ . The number of presenting symptoms increased with a decrease in  $CD_4$  counts, with a highly significant inverse correlation (p=0.000) between number of symptoms and  $CD_4$  count. About 69.6% of HIV patients had  $CD_4$  count in the range of 50-250 cells/mm<sup>3</sup> at the start of ART. At 6 months follow up 36.9% of patients had  $CD_4$  count in range of 50-250 cells/mm<sup>3</sup> and 36.8% had in range of

250-400 cells/mm<sup>3</sup>. The average CD4 count difference

was found to be statistically highly significant (Table 5).

Table 6: Weight of HIV patients at initial stage and after 6 month of period in three year	ars.
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Year	Paired samples sta	Paired samples statistics			Paired differences	
rear	Weight	No.	Mean±SD	Mean±SD	Statistical value	
2009	At initial stage	1157	42.50±11.75	3.55±6.11	t=19.77; df=1156	
2009	After 6 months	1157	46.05±11.95	3.33±0.11	p<0.001	
2010	At initial stage	1307	42.91±11.32		t=26.58; df=1306	
2010	After 6 months	1307	46.94±11.81	4.03±5.48	p<0.001	
2011	At initial stage	457	44.68±12.18	1.71±5.17	t=7.07; df=456	
2011	After 6 months	457	46.40±12.97	1./1±3.1/	p<0.001	

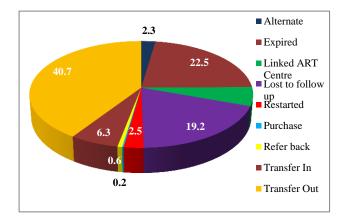


Figure 1: Status of HIV patients at ART centre.

Weight of HIV +ve patients was also taken as one of the parameters for treatment success. The average weight of total HIV +ve patients at the first contact was found to be 42.95 Kg±11.47 SD while at 6 month follow up it was46.51 Kg±12.06 SD. The ranges of weight at initial stage were between 4-90 kg while at 6 months it was between 7-94kg. At initial stage during three year study period 38.4% of HIV +ve patients on ART had weight in range of 35-44 kg while 31.8% of total HIV +ve patients on ART had weight in range of 45-54 kg. The difference between weight at initial and after 6 months were statistically significant (p<0.001) (Table-6).

Anemia was a common finding in patients on ART and hemoglobin levels were estimated on regular basis. Among all HIV +ve patients at ART, 65.8% had Hb level in the range of 10-15 gm/dl, while 32% had Hb in range of 5-10 gm/dl. At ICTC out of 40969 patients tested, 5265 were found to be HIV positive. Maximum numbers of HIV +ve patients (89.3%) were from Uttar Pradesh while 10% were from Bihar. Other states like Jharkhand and Madhya Pradesh contributed only 0.3% and 0.2% respectively. There was a considerable gap between total patients diagnosed HIV+ve at ICTC and number of patients registered at ART centres.

In few patients alternate 2<sup>nd</sup> line antiretroviral drugs were used. 33 (1.2%) patients positive for HIV-1 and 24 (0.9%) patients positive for HIV-2 were on alternate drugs. 5 (0.2%) patients diagnosed in early infancy were

on alternate drugs. A significant 19.2% of HIV +ve patients were lost to follow up and 40.7% were transferred out to another ART centres. In spite of adequate treatment adherence 22.5% patients were expired (Figure 1).

#### **DISCUSSION**

The epidemic of HIV/AIDS in India is shifting from 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 the present study, males represented higher percentage (63.7%) because of their high outdoor activities and mobility. Male to female ratio was 1.75:1. In a study done by Mandal et al. 81.16% of cases were in the age group of 20-40 years with male to female ratio of 1.5:1. Similar observations were made in studies done by Ahmad et al<sup>8</sup> and Singh et al.<sup>9</sup> HIV seems to be affecting the economically productive, sexually active group and thus having a tremendous impact on the livelihood of the affected family. In the present study maximum HIV +ve patients on ART were in age group of 35-49yrs followed by 25-34 years age group (31.7%). These findings were very much similar to NACO statistics that reported 89% of the cases 15-44 years age group. This section of the population is more affected because they are economically productive, sexually more active and the social structure is patriarchal.<sup>3</sup>

Majority of patients who attended the ART Centre were illiterate (36.2%). These finding were similar to study conducted by Jayaram et al in Karnataka, India. Low education status and less awareness regarding safe sex can be the reason for high prevalence among this group of people. High proportion of widow positivity might be due to higher sexual aggressiveness of young widows (15-34 years) when their husband died of AIDS. With regard to marital status majority of patients were married (71.53%), but widows (20.3%) outnumbered unmarried (8.0%). More number of married persons (70.3%) having HIV/AIDS was also reported by Jayaram et al.7 All widows gave history of death of their husbands due to HIV/AIDS. This clearly indicates that most of the females got infection from their husbands. Large part of married women, who were divorced (2.73%) or separated (1.96%) were due to their HIV status. Similar findings with regard to widow/widower, divorcee, separated HIV positive patients were quoted by Bahl et al (widows 42.86%, widower 1.79%) and Amballi et al (separated 4.93%, divorcee 2.47%). Labourers stay away from their families for long duration and get involved in promiscuous behavior. This implies that the labourers are working as a link population and spreading the disease to general population. Majority of patients on ART were not related to any particular occupation and constituted 81.8% of cases. In the present study about 2.7% were truck driver. Mandal et al found that the main risk groups were truck drivers and labourers.7

The predominant mode of transmission was through unprotected heterosexual intercourse (70.5%). More or less similar findings were reported by Gupta et al (97%). <sup>12</sup> Intravenous drug abuse was the mode of transmission in 3.4% of cases. Only 0.5% cases were attributed to men having sex with men (MSM) and homosexuality and the reason could be the social taboos associated with the practice of these risk factors. Overall, number of patients acquiring disease due to contaminated blood transfusion was about 2.4%. 17.6% patients did not know about their routes of transmission. In a study by Kothari et al showed that heterosexuality accounted for 90% of the total cases. <sup>13</sup>

The major manifestations of HIV/AIDS namely weight loss, chronic fever and diarrhea were comparable with previous reports. 14,15 Many previous studies have reported other complaints like problem in conception, fertility and disorders. 16,17 33.1% neurological patients opportunistic infections (OIs) at the time of their first presentation in the clinic. The spectrum of opportunistic infection observed in this study is similar to those studies reported from other parts of the country. 18 The proportion of symptomatic patients (82.0%) were higher than patients with opportunistic infections (64.4%) at the time of reporting. Pulmonary tuberculosis (19.7%) was the most common opportunistic infection, followed by Extrapulmonary (12.6%) and Pulmonary + extra-pulmonary (0.6%). After confirmation of HIV infection by VCTC center in the department of Microbiology of the institute, CD<sub>4</sub> count was done. CD<sub>4</sub> lymphocyte counts were determined by FACS Count (Becton Dickinson). Specific opportunistic infections were diagnosed on the basis of standard clinical definitions and laboratory procedures. Chemo-prophylaxis and antiretroviral therapy was advised as indicated. Viral load estimation was not done because of the financial constraints. In India, the most common opportunistic infection among people with HIV infection is pulmonary tuberculosis. 19 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%.20 Low levels 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% percent during the life-time of HIV –negative individuals.<sup>21</sup>

CD4 count is one of most reliable investigation for clinical staging of patients and used to make decision on treatment initiation. The prolonged course of HIV infection is marked by a decrease in number of circulating CD4+ T helper cells and persistent viral replication resulting in immunologic decline and death from opportunistic infections.<sup>22</sup> Majority of patients presented with an initial CD4 count of less than 300 cells/mm<sup>3</sup> consistent with previous study.<sup>23</sup> Patients were offered antiretroviral therapy if their CD4 lymphocyte count was less than <350 cells/mL. Trimethoprim-Sulphamethoxazole prophylaxis was given to prevent Pneumocystis carinii pneumonia in patients with a CD<sub>4</sub> lymphocyte count of <200 cells/mm<sup>3</sup>. The patients were followed up every 3-6 months during which their weight, hemoglobin level and CD<sub>4</sub> lymphocyte count were monitored. The mean CD<sub>4</sub> count of at initial stage was 166.26±124.83 and after 6 months was 319.16±162.06. The number of presenting symptoms increased with a decrease in CD<sub>4</sub> counts, with a highly significant inverse correlation (p=0.000) between number of symptoms and CD<sub>4</sub> count.

In a study by Bachani et al, 71% of patients were started on d4T+3TC+NVP and ZDV+3TC+NVP was prescribed to 28% of the patients.<sup>24</sup> HIV infected patients with CD4 count <200 cells/mm3 were at higher risk for OI, non AIDS morbidity and death than HIV-infected patients with higher CD4 counts. Randomized controlled trials in patients with CD4 counts <200 cells/mm3 and/or history of an AIDS defining condition suggest that ART improves survival and delays disease progression. 25,26 Although 74% patients opted for antiretroviral therapy at the time of presentation, many were soon lost to follow up. Cost constraints, illiteracy, predominance of migrant workers, lack of a source of income amongst the study subjects were important reasons for the poor compliance. Limited affordability allowed only CD4 count, body weight and hemoglobin levels for assessment of patients on antiretroviral therapy, and these were quite helpful. There was significant increase in the values of all the three parameters in the ART group while in patients without ART.

### **CONCLUSION**

HIV infection is one of the major infectious diseases and being chronic lifelong in nature, its impact is huge compared to other infectious diseases. People with high risk behavior and the spouse of the affected couple need to be educated for primary and secondary prevention of the disease. Combination of behavioral risk factors and unawareness is responsible for rapid spread of HIV/AIDS. The Referral system for high risk groups to ICTC, STI and ART needs to be strengthened and closely monitored. HIV patients need to be educated about timely

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initiation and continuous intake of antiretroviral therapy. It not only prolongs their survival but also decreases the viral load and transmission of the disease. This disease affects not only the quality of life but the additional burden of treatment completely devastates the affected families. Therefore, the entire family needs support and care from both the community and the government. Provision of free antiretroviral treatment by the government of India is a step in the right direction, and it should be extended to the entire country. The Antiretroviral treatment not only changes the quality of life of the patients and their families but also lets them go back to their normal life and earn their livelihood.

## **ACKNOWLEDGEMENTS**

The authors gratefully acknowledge the support from the management of Institute of medical sciences, BHU; Director Dr T. M. Mohapatra; Dr Shyam Sundar, Professor and Head, Department of Medicine; Dr A.K. Gulati, Department of microbiology; and ART clinic staffs for their support.

Funding: No funding sources Conflict of interest: None declared Ethical approval: The study was approved by the Institutional Ethics Committee Banaras

University, Varanasi, Uttar Pradesh

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Cite this article as: Kumari R, Kumar M, Mohapatra SC. Clinico-demographic profile of HIV patients at ART centre of a tertiary care referral hospital in North India. Int J Community Med Public Health 2017;4:3166-73.