

ORIGINAL RESEARCH

Immunological Status of Newly Diagnosed HIV Positive Population at ICTC SMS Medical College, Jaipur

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ABSTRACT

Introduction: Acquired immunodeficiency syndrome (AIDS) is caused by retrovirus known as Human Immunodeficiency Virus (HIV), which breaks down the body's immune system. Two known types of this virus include the HIV-1 and HIV-2. HIV infects CD4+T lymphocytes mainly replicates within them and lyses the cells as the replicated virions are released extracellular to infect other CD4+ T cells². The CD4+T cells count is a useful tool for the initiation and the follow up of the anti-retroviral therapy response.

Materials And Methods: Observational study conducted over a period of one year, a total of 181 HIV positive patients were studied. Patients were tested for CD+T lymphocyte by BD BIOSCIENCE FACS CALIBUR machine.

Results: Out of 181 HIV positive patients, majority of the patients were between 26 and 35 years of age-group 29.3% , 125(69.1%) male and 55 (30.4%) females.

50.8% had primary level of education In present study 22% participants were non-agriculture laborer's. Major route of transmission of HIV in study participants was through heterosexual contact 97.8%.

Conclusion: The immunological status of HIV positive individuals at the time of diagnosis plays a vital role in the success of treatment. Our finding suggests most of the newly diagnosed HIV positive individuals were late presenter with CD4+ T lymphocyte count less than 350 cells/mm³. Our results show that lower educational levels, migrant labourers and unsafe sexual practices (without barrier methods, multiple sex partners, commercial sex workers) are the major risk factors for the acquisition of HIV.

Keywords: Immunological Status, HIV, CD4+T lymphocytes.

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is caused by retrovirus known as Human Immunodeficiency Virus (HIV), which breaks down the body's immune system. Two known types of this virus include the HIV-1 and HIV-2 which belong to a family of primate lentivirus. Acquired Immune Deficiency Syndrome is one of the major causes of morbidity and mortality worldwide, accounting for over 35 million deaths since the first reported cases in 1983.¹

In India, National AIDS Control Organization (NACO) has introduced Integrated Counseling and Testing Centers (ICTC) as an effort to curb the devastating impact of HIV infection in society. It has role not only in HIV prevention but also it acts as an early point to care treatment and support for People Living with HIV and AIDS.

The CD (cluster of differentiation), is a protein expressed on the cells of hematopoietic system. Those cells which express CD4+T and CXCR4 cell-surface molecules serve as a receptor and co-receptor for human immunodeficiency virus (HIV), respectively. HIV infects CD4+T lymphocytes mainly replicates within them and lyses the cells as the replicated virions are released extracellularly to infect other CD4+ T cells.² By selectively targeting the CD4+ T lymphocytes cell, infection with CD4+ T lymphocytes cell count provides a picture of immune system competence. It can be regarded as the accurate measurement of the robustness and functionality of the immune capability to protect the body against general infection. CD4+ T lymphocyte cell depletion is one of the hallmarks of progression of HIV infection and a major indicator of the stage of the disease in HIV infected individuals.³ The measurement of CD4+ T lymphocyte count is important as despite successful implementation of control programs, there is rise in HIV /AIDS cases and most of deaths in cases of AIDS are because of opportunistic infection and other malignancies.⁴ Early diagnosis of HIV infection is important for the individual.² It helps controlling spread of infection in population. With early diagnosis and treatment, outcome is improved, and the risk of transmission can be reduced by reducing individual's infectivity through antiretroviral therapy (ART) and by behavior change.^{3,4} Late presenters have an increased risk of clinical progression and mortality and show a poor immune recovery when starting Highly Active Antiretroviral therapy (HAART).

MATERIAL AND METHODS

The study was conducted in Department of Microbiology Sawai Man Singh Medical College, Jaipur. One hundred and eighty-one participants attending Integrated Counseling and Testing Centre (ICTC) and ART (Anti-Retroviral therapy) centre were included. The HIV status of these participants was confirmed at Integrated Counseling and Testing Centre (ICTC) by three different antibody tests with three different principles as per NACO guidelines. The study was conducted over a period of one year from June 2019 to May 2020. This was a hospital-based observational study. At the time of enrolment, informed consent was obtained from participants and a pro forma was filled which consisted of socio-demographic characteristics and personal details. The study was approved from Institute Ethics Committee (IEC) of SMS Medical College, Jaipur. All the participants were included if they agreed to participate in the study.

This strategy was followed for the diagnosis of asymptomatic HIV patients, antenatal screening and screening of patients awaiting surgeries. Test format was used in which all samples tested reactive in first test were confirmed by second and third test. First test used was more sensitive and 2nd and 3rd test used were more specific. Positive report was given only if all three tests were reacting separate containers.

RESULTS

The present study was conducted in the Department of Microbiology, SMS Medical College, Jaipur (Rajasthan). One hundred and eighty-one newly diagnosed HIV positive participants were included in study as per statistical requirement. This study was conducted over a period of one year from June 2019 to May 2020. The samples were processed, and data were analyzed. Results of the present study are as follows:

In present study majority of the patients were between 26 and 35 years of age-group 29.3% followed by 36-45 years 28.2%. Mean age of the subjects was 39.8years. In present study out of 181 participants, 69% of participants were male, 30.4% were female.

The male and female ratio in our study was 2.27:1. More than half of the participants 50.8% had primary level of education while 19.9% were illiterate. Only 16.5% participants had college or above level of education. In present study 22% participants were non-agriculture labourer followed by agriculture landholder 20.4%, housewives 16%, self-employed 14.9%, and hotel staff 11%. Major route of transmission of HIV in study participants was through heterosexual contact 97.8% and it was mainly by contact with commercial sex partners 67.7%. Three patients were infected through parenteral route 1.7% while one participant got vertically infected from parents.

In present study, among the participants with CD4+T count <200 cells/mm³, maximum participants were of age group of 36-45 years 30.2% followed 27.1% in age group 26-35 years. Among those with CD4+T count between 200-500 cells/mm³, maximum subjects were in the age-group of 26-35 years 34.8% followed 27.3% participants in 36-45 years. There was a near equal age distribution of participants who had CD4+T count >500 cells/mm³. No association of CD4+T count with age was found in present study (P=0.417). Approximately, in all age groups majority of participants had CD4+T count <200 cells/mm³.

females have higher CD4+T lymphocyte count in comparison to males as among the participants with CD4+T count <200 (cells/mm³), 76, 22.9% were females while in participants with CD4+T count >500 (cells/mm³), 47.4% were males, 52.6% were females. 66.8% study participants were provider initiated and remaining 33.3% participants attended ICTC voluntarily. Among the study participants 53.71% provider-initiated participant and 56.1% voluntary participants had CD4+ T lymphocyte count <200 cell/mm³. CD4+T count was not statistically significantly associated with type of population (P=0.928). 71.8% study participants were Late presenters CD+4 T lymphocyte count <350 cells/mm³) while remaining 28.2% were early presenters CD+4 T lymphocyte count > 350 cells/m.

Table 1: Age distribution of study participants

Age-group (Years)	Number of participants	Percentage
≤ 25	23	12.7
26-35	53	29.3
36-45	51	28.2
46-55	36	19.9
>55	18	9.9
Total	181	100.0

Table 2: Gender distribution of study participants

Gender	Number of participants	Percentage
Male	125	69.1
Female	55	30.4
Transgender	1	0.6
Total	181	100.0

Table 3: Education status of study participants

Education status	Number of participants	Percentage
Illiterate	36	19.9
Primary	92	50.8
Secondary	23	12.7
College and above	30	16.6

Total	181	100.0
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Table 4: Occupation-based distribution of study participants

Occupation	Number of participants	Percentage
Non-agriculture labourer	40	22.1
Domestic servant	1	0.6
Housewife	29	16.0
Skilled worker	1	0.6
Semi-skilled worker	9	5.0
Self-employed (business)	27	14.9
Service (Govt. or Private)	8	4.4

Table 5: Route of transmission of HIV in study participants

Route of transmission	Number of participants	Percentage
Heterosexual	177	97.8
Parenteral route	3	1.7
Parent to child	1	0.6
Total	181	100.0

Table 6: CD4 +T-lymphocyte count distribution of study participants

CD4+ T-lymphocyte count (cells/mm ³)	Number of participants	Percentage
<200 cells/mm ³	96	53.0
200-500 cells/mm ³	66	36.5
>500 cells/mm ³	19	10.5
Total	181	100.0

Table 7: Distribution of participants on the basis of gender and time of presentation

	n	Male	Female	Transgender	P value
Earlypresentation	51	30 (58.8%)	21 (41.2%)	0	0.123
Latepresentation	129	95 (73.64%)	34(26.35%)	1(0.8%)	

DISCUSSION

Acquired immunodeficiency syndrome (AIDS) is caused by retrovirus known as human immunodeficiency virus, which break down the body's immune system. HIV /AIDS has become one of the major public health problems in India.⁶ Two known types of this virus include the HIV-1 and HIV-2 which belong to a family of primate lentivirus.^{6,7}

The CD+4 T lymphocyte are the present study, male to female ratio was 2.27:1. Male to female ratio was reported 1.78:1 in the study done by Bishnu et al.⁹ In study by GorantalaandKondagunta, male to female ratio was 1.84:1. Our results differ from the abovementioned studies. The male preponderance might be due to the fact that in the existing social milieu in India, females do not seek medical care fearing isolation and loss of family support primary target of HIV infection because of the affinity of virus to the CD+T cell surface marker.⁵

In present study, male to female ratio was 2.27:1. Male to female ratio was reported 1.78:1 in the study done by Bishnu et al.⁹ In study by Gorantalaand Kondagunta¹³, male to female ratio was 1.84;1. The male preponderance might be due to the fact that in the existing social milie

In present study, more than half of the participants (50.8%) had primary level of education while 19.9% were illiterate. Approximately 16.5% participants had college or above level of education. Similar results were reported by Bishnu et al,⁹Gorantalaand Kondagunta¹³, and

Kumawat et al.¹¹ in India, females do not seek medical care fearing isolation and loss of family support.

In present study, the major route of transmission was through heterosexual contact (97.8%), out of these 66.2% individuals had transmission of HIV through commercial partner while in 47.5% participants; transmission of HIV was through regular partner. Three patients were infected through blood and blood products while one participant had parental route of transmission. In a study done Delpierre¹² et al. reported 47% of patients have acquired HIV through heterosexual transmission.¹⁰ Bishnu et al reported that 76.39% patients having HIV acquired through heterosexual route of transmission.

On the basis of CD4+ T Lymphocyte count presentation at HIV care were categorized into two groups. A patient diagnosed with the first CD4+ T Lymphocyte count <350/mm³ are late presenters, while who have CD4+ T lymphocyte count >350 are considered as early presenters. In present study 71.27 % study participants were late presenters. In a study conducted by Hu et al, 70.2% study participants were late presenters. Celestia et al reported that 55.6% individuals were late presenters. Dickson et al reported that 50.0% were late presenters. Chadborn et al reported that 42% study participants were late presenters.⁴⁹ In our study the late presenters were more in number as majority of study population in present study are illiterate or lower level of education may have a limited awareness of HIV and may not have significant acceptance of VCT services due to of social stigma of HIV in society.

CONCLUSION

HIV infection is a serious problem throughout the world as it causes progressive degradation of immune system. The immunological status of HIV positive individuals at the time of diagnosis plays a vital role in the success of treatment.

Our finding suggests that in present scenario in our region most of the newly diagnosed HIV positive individuals attending the ICTC facility were provider initiated. Majority of them were Late presenter with CD4+ T lymphocyte count less than 350 cells/mm³. Low CD4+ T count at the time of presentation indicates already compromised immune system and is consistent with severe disease.

Our results show that lower educational levels, migrant labourers and unsafe sexual practices (without barrier methods, multiple sex partners, commercial sex workers) are the major risk factors for the acquisition of HIV.

Thus, it is recommended that universal HIV testing should be promoted in the society. It should be considered as routine medical testing so that stigma associated with HIV can be removed. For this it is important to strengthen the public knowledge about HIV diagnosis, prevention, care support and treatment. HIV testing should be especially targeted to people who live away from family for long time. Education about safe sex practices should be enhanced through educational and awareness programs.

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