

## Study on High Risk Behavior and Prevalence of Opportunistic Infections in HIV Patients Attending ART Centre of a Medical College of Rajasthan

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### Abstract

**Background:** HIV infection/AIDS is a global pandemic, with cases reported from virtually every country. At the end of 2018, an estimated 37.9 million individuals were living with HIV infection according to the Joint United Nations Program on HIV/AIDS (UNAIDS). It is spreading due to high risk behavior as unprotected sex (including anal and oral sex), contaminated blood transfusions, hypodermic needles etc. With the fall in CD4 count the risk of opportunistic infection increases.

**Methods:** This study was conducted at ART centre of RNT Medical College, Udaipur (Raj.) on 200 HIV/AIDS patients during the period of March 2018 to February 2019 with the objective to study their sociodemographic profile, high risk behavior and opportunistic infection.

**Results:** Majority of study subject i.e 39% were in the age of 41-50 years. The most common presenting complaint was fever as seen in 57.5%. Common opportunistic infection study subject suffering were oral candidiasis (40.5%) cases followed by Pulmonary TB [37.5%] and esophageal candidiasis [16%] cases. The most common high risk behavior was unprotected heterosexual sex [54%] followed by IDU [9.5%] and MSM (1%).

**Conclusion:** Among PLHIV attending ART centre males with 41-50 years were in majority with heterosexual sex and IDU was the commonest high risk behavior among them. Oral candidiasis was the commonest opportunistic infection among them.

**Keywords:** High Risk Behavior, opportunistic infections, unprotected sex, HIV infection

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### Introduction

AIDS is one of the most devastating infectious diseases in human history, and its causative agent HIV, has been responsible for nearly 75 million infections. [1,2] HIV is spread primarily by unprotected sex

(including anal and oral sex), contaminated blood transfusions, hypodermic needles, and from mother to child during pregnancy, delivery, or breastfeeding. Some bodily fluids, such

as saliva and tears, do not transmit HIV. Methods of prevention include safe sex, needle-exchange programs, and treating those who are infected. Specific tests for HIV include antibody and antigen detection. Conventional HIV antibody testing is done by ELISA. Positive specimens are then confirmed by a different method (eg. Western blot). The sensitivity of screening serologic tests is > 99.9%.

There is no cure or vaccine; however, antiretroviral treatment can slow the course of the disease and may lead to a near-normal life expectancy. Treatment is recommended as soon as the diagnosis is made. Without treatment, the average survival time after infection is 11 years. [3]

The number of HIV-infected patients has increased dramatically in the past decade. HIV infection causes systemic disease with many complications beyond acquired immunodeficiency syndrome (AIDS) illnesses that may not yet be recognized. Any HIV-infected individual with a CD4+ T cell count of <200/micro L has AIDS by definition, regardless of the presence of symptoms or opportunistic diseases. [4] The three CD4+ T-lymphocyte categories are defined as follows:

Category 1: greater than or equal to 500 cells/micro L

Category 2: 200-499 cells/micro L

Category 3: less than 200 cells/micro L

The most common cause of HIV disease throughout the world, is HIV-1, which comprises several subtypes with different geographic distributions. [5] More than 95% of people living with HIV/AIDS reside in low- and middle-income countries; 50% are female, and 2.9 million are children <15 years [6] The cell principally infected is the CD4 (helper-inducer) lymphocyte, which directs many other cells in the immune network. With increasing duration of infection, the number of CD4 lymphocytes falls. [7]

In untreated patients or in patients in whom therapy has not adequately controlled virus replication, after a variable period, usually measured in years, the CD4+ T cell count falls below a critical level (<200/L) and the patient becomes highly susceptible to opportunistic disease. [8] Tb infection is caused by M tuberculosis bacteria specially in an increased rate in immune deficiency state in disease like HIV. At least one-third of the 34 million people living with HIV worldwide are infected with latent TB. Persons co-infected with TB and HIV are 21-34 times more likely to develop active TB disease than persons without HIV. In 2012, 1.1 million (13%) of 8.6 million people who developed TB worldwide were HIV-positive. In the same year, 1.3 million died from TB, of which 320, 000 were people living with HIV [9]

In the study of Tabarsi et al [10] oral candidiasis seen in 59% cases and Pulmonary TB in 12%, but Koethe et al(11)observed low opportunistic infection, oral candidiasis seen in only 13% cases. in the study of Tabarsi et al [10] unprotected heterosexual behavior was seen in only 32% cases and 54% were IDU. Olawumi et al [12] found unprotected heterosexual behavior in 57 % cases and unsafe transfusion in 18%.

So keeping in mind the above data this study was done with the following.

### Objectives:

1. To study the socio-demographic characteristics of HIV patients attending an ART centre of a medical college of Rajasthan.
2. To study the high-risk behavior among the study subject.
3. To study the prevalence of opportunistic infections in them.

### Material and Methods

This study was conducted at RNT Medical College, Udaipur (Raj.) on 200 HIV/AIDS patients presenting to and registered at ART Centre MB Govt. Hospital, Udaipur during

the period of Mar, 2018 to Feb, 2019 after approval from institutional ethical committee and written and well informed consent from patient

#### Inclusion Criteria:

HIV infected/AIDS patients > 18 years of age. A detailed history was taken about the symptoms and also about their high risk behavior. Any earlier history of documented opportunistic infection were noted and symptoms suggesting of any other opportunistic infection were tested by

required relevant investigations. Clinical examination was done and laboratory investigations including Total and Differential WBC Counts, CD4+ Cell Counts was done. CD4+ T lymphocyte counting was done in automated four-color BD – two laser FACS calibur with multiset software instrument using flow cytometry single platform technology.

#### Results

The following results were obtained

**Table 1: Distribution of study population according to Sociodemographic Characteristics**

<b>Distribution according to Age (Yrs)</b>		
<b>Variable</b>	<b>No of cases</b>	<b>% of cases</b>
<20	2	1.0
21-30	45	22.5
31-40	59	29.5
41-50	78	39.0
51-60	13	6.5
61-70	3	1.5
Total	200	100.0
<b>Distribution according to Sex</b>		
Male	147	73.5
Female	53	26.5
<b>Distribution according to Socioeconomic Status</b>		
Upper	11	5.5
Middle	127	63.5
Lower	62	31
Total	200	100

Out of total 200 patients mostly i.e 182 [91%] were 20-50 years of age, which is the most productive age of life and only 16 [8%] were above 50 years of age. Majority were in the age of 41-50 years i.e 78 [39%]. The mean age was  $42.67 \pm 58$  years. Of the total cases predominantly were males i.e 147 [73.5%] and females were only 53 [26.5%]. Male: female ratio was 2.77 : 1. Most of the cases i.e 127 [63.5%] were from the middle Socioeconomic status (S.E.S.), 62 [31%] were from lower class and only 11 [5.5%] were from the upper Socioeconomic status (SES.).

**Table 2: Distribution of study population according to presenting complaints of the patients (N=200)**

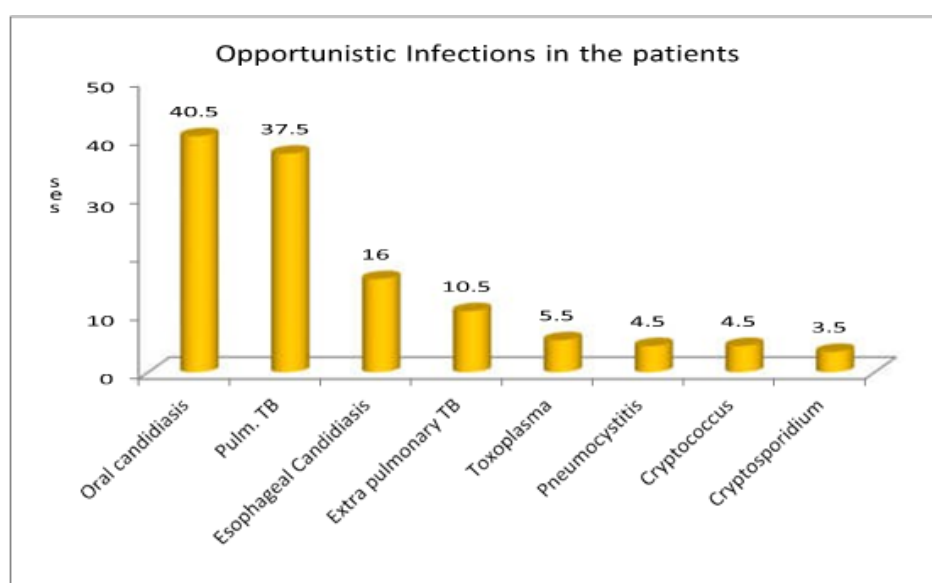
<b>Complaints</b>	<b>No. of patients</b>	<b>%</b>
<b>Fever</b>	115	57.5
<b>Cough</b>	87	43.5
<b>Weight Loss</b>	77	38.5
<b>Breathlessness</b>	63	31.5
<b>Diarrhoea</b>	41	20.5
<b>Seizures</b>	11	5.5
<b>Altered sensorium</b>	9	4.5
<b>Neck swelling</b>	8	4

The most common presenting complaint was fever seen in 115 [57.5%] cases followed by cough and weight loss in 87

[43.5%] and 77 [38.5%] respectively. Breathlessness was seen in 63 [31.5%] cases and diarrhoea in 41 [20.5%]. Only 11 [5.5%] cases were having seizures.

**Table 3: Distribution according to opportunistic Infections in the patients**

Opportunistic Infections	No. of patients	%
Oral candidiasis	81	40.5
Pulm. TB	75	37.5
Esophageal Candidiasis	32	16
Extra pulmonary TB	21	10.5
Toxoplasma	11	5.5
Pneumocystitis	9	4.5
Cryptococcus	9	4.5
Cryptosporidium	7	3.5

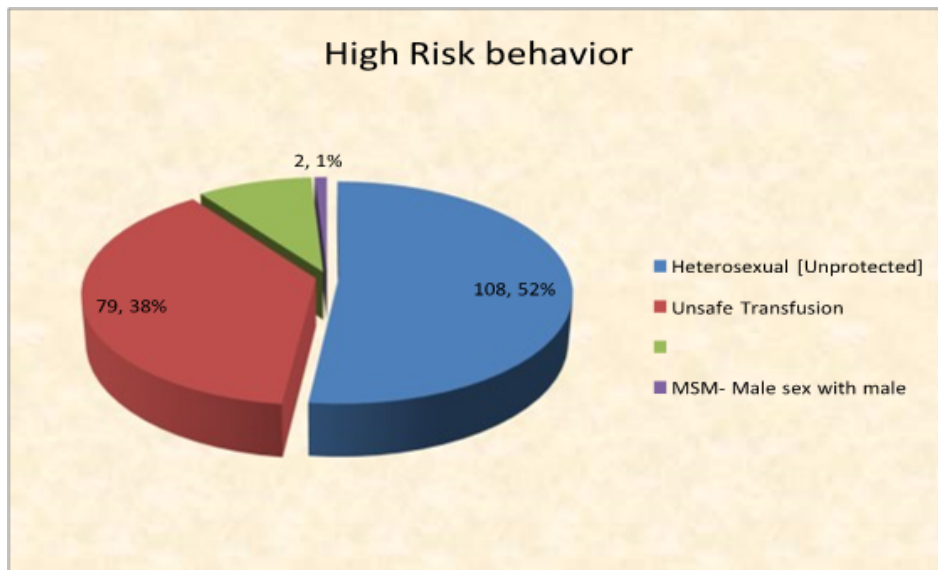


**Figure 1: Graph showing distribution of study population according to opportunistic infections**

Opportunistic infections were seen in large no of cases. The most common was oral candidiasis seen in 81 [40.5%] cases followed by Pulmonary TB in 75[37.5%] and esophageal candidiasis in 32 [16%] cases. Toxoplasmosis was seen in 11 [5.5%] cases.

**Table 4: Distribution of study population according to High Risk behavior of the patients**

High Risk Behavior	No of patients	%
Heterosexual [Unprotected]	108	54
Unsafe Transfusion	79	39.5
IDU	19	9.5
Male sex with male [MSM]	2	1



**Figure 2: Graph showing distribution of study population according to High Risk**

### Behaviour

High risk behavior was inquired in the cases. The most common was unprotected heterosexual behavior seen in 108 [54%] of the cases. 79 [39.5%] had history of unsafe transfusion. IDU users were 19[9.5%] and 2 (1%) were MSM.

CD4 count was tested in all the cases. In majority cases it was between 200-500 i.e 96 [48%] and in 63 [31.5%] it was less than 200. However it was above 500 in 41 [20.5%] cases.

### Discussion

This study was conducted at RNT Medical College, Udaipur, (Raj.) on 200 HIV/AIDS patients presenting to and registered at ART Centre, MB Govt Hospital, Udaipur during the period of Mar, 2018 to Feb, 2019.

In this study out of total 200 participants most were 20-50 years (mean age  $42.67 \pm 5.8$  years). About 92% (182) were less than 50 years of age, and only 8% (16) were above 50 years of age and rest 1% (2) cases were less than 20 years. Majority i.e 78 (39%) were in the age of 41-50 years.

In the study of Lang et al [13] the mean age was  $47.5 \pm 3.4$  years, while In Tabarsi et al(10) study the mean age for all 111 HIV patients was  $38 \pm 9$  years (range 22-70) Olawumi et al [12] One hundred

and eighty-five patients aged  $37 \pm 10$  years were recruited to this study and in the study of Koethe et al [11] the mean age was  $41.6 \pm 2.2$  year

In our study of the total cases 73.5% (147) predominately were males and only 26.5% (53) were females. Male: female ratio was 2.77:1.

Similarly in the study of Tabarsi et al [10] majority 107 (96.3%) were men. But in the study of Olawumi et al [12] the ratio was pretty close (91 male and 94 female) and in the study of Lang et al [13] the males were in majority 67%. The most common presenting complaint was fever seen in 115 [57.5%] cases followed by cough and weight loss in 87 [43.5%] and 77 [38.5%] respectively. Breathlessness was seen in 63 [31.5%] cases and diarrhea in 41 [20.5%]. 11 [5.5%] cases were having seizures. Similarly in the study of Lang et al [13] fever was the commonest feature [68%] followed by weight loss [53%]. In the study of Olawumi et al [12] fever was seen in 75% cases and weight loss was in 42% cases but diarrhoea was in 47% cases.

But Koethe et al [11] found in their study that fever was seen in only 24% cases while weight loss was the predominant symptom seen in 57% cases. Opportunistic infections were seen in large no of cases. The most

common was oral candidiasis seen in 81 [40.5%] cases followed by Pulmonary TB in 75[37.5%] and esophageal candidiasis in 32 [16%] cases. Toxoplasmosis was seen in 11 [5.5%] cases. Lang et al [13] found opportunistic infection in 67% of cases, oral candidiasis seen in [38%] cases and Pulmonary TB in [17%], Similarly In the study of Tabarsi et al(10) oral candidiasis seen in [59%] cases and Pulmonary TB in [12%], but Koethe et al [11] observed low opportunistic infection, oral candidiasis seen in only 13% cases.

High risk behavior was enquired in the cases. The most common was unprotected heterosexual behavior seen in 108 [54%] of the cases. 79 [39.5%] had history of unsafe transfusion. IDU users were 19[9.5%] and 2 (1%) cases were Male having sex with male (MSM.) Lang et al found unprotected heterosexual behavior in majority of the cases [68%] and male sex with male (MSM) in 3%. But in the study of Tabarsi et al [10] unprotected heterosexual behavior was seen in only 32% cases and 54% were IDU. Olawumi et al [12] found unprotected heterosexual behavior in 57 % cases and unsafe transfusion in 18%.

In our study CD4 count was tested in all the cases. In majority cases it was between 200-500 i.e 96 [48%] and in 63 [31.5%] it was less than 200, however it was above 500 in 41 [20.5%] cases. The mean CD4 count was  $378.4 \pm 23.7$ . In the study of Tabarsi et al [10] the mean CD4 counts were 176 and 140 in patients with good outcomes and poor outcomes, respectively. [14]

### Summary and Conclusion

Males were more common in the study [73.5%] indicates more sexual promiscuity in males. More people presented with a late onset of illness(> 6 months). Most Common opportunistic infection was oral candidiasis. Heterosexual behaviour most common risk factor of our study patients.

### Bibliography

Sharma *et al.*

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1. WHO [www.who/hiv](http://www.who/hiv) website in February 2019.
2. Harrison Principles of Internal Medicine 20Th Edition 2018: Chapter 197. Human Immunodeficiency Virus Disease: AIDS and Related Disorders Dan L. Longo, Anthony S. Fauci, Gregory K. Folkers, H. Clefford Lane.
3. Katz IT, Ryu AE, Onuegbu AG. Impact of HIV-related stigma on treatment adherence: systematic review and meta-synthesis. *J Int AIDS Soc.* 2013;16(3 suppl 2):18640.
4. United Nations Joint Programme on HIV/AIDS. UNAIDS report on the global AIDS epidemic. 2018. Available at: [http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2018/gr2018/UNAIDS\\_Global\\_Report\\_2018\\_en.pdf](http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2018/gr2018/UNAIDS_Global_Report_2018_en.pdf).
5. Joint United Nations Programme on HIV/AIDS (2018). "Overview of the global AIDS epidemic". UN report on the global AIDS epidemic 2018. [http://www.unaids.org/globalreport/Global\\_report.htm](http://www.unaids.org/globalreport/Global_report.htm).
6. Mandell, Douglas, and Bennett's principles and practice of infectious diseases Gerald L. Mandell, John E. Bennett, Raphael Dolin.—6th ed. Chapter 166 : hiv
7. UNAIDS. The gap report. Geneva, Switzerland: United Nations; 2014.
8. Bedelu M, Ford N, Hilderbrand K, Reuter H. Implementing antiretroviral therapy in rural communities: the Lusikisiki model of decentralized HIV/AIDS care. *J Infect Dis.* 2007; 196(suppl 3):S464–8.
9. HIV/TB Module for Health Care Workers. May, 2016; NACO; MOHFW via net (<http://www.naco.gov.in/HIV-TB>)
10. Tabarsi P, Chitsaz E, Moradi A, Baghaei P, Farnia P, Marjani M . Treatment outcome, mortality and their predictors among HIVassociated tuberculosis patients. *Int J STD AIDS.* 2012 Sep; 23(9): e1-4.

11. Koethe JR, Heimbürger DC. Nutritional aspects of HIV-associated wasting in sub-Saharan Africa. *Am J Clin Nutr.* 2010; 91(4):1138S-1142S.
12. HO Olawumi, PO Olatunji The value of serum albumin in pretreatment assessment and monitoring of therapy in HIV/AIDS patients *HIV Medicine.* 2006; 7: 351–355.
13. Lang J, Scherzer R, Tien PC. Serum albumin and kidney function decline in HIV-infected women. *Am J Kidney Dis.* 2014 Oct; 64(4):584-91.
14. Namukwambi R. N., Tuhadeleni O., & Van Neel R. The Knowledge and Practices of Handwashing Among Street Food Vendors in the Keetmanshoop Municipal Area: none. *Journal of Medical Research and Health Sciences.* 2022; 5(4): 1860–1865.