

Original Article

Prevalence and Spectrum of Opportunistic Infections (OIs) Among HIV Positive Cases on Anti Retroviral Therapy (ART) Attending ART Centre Government Medical College (GMC), Jammu in Northern India.

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Abstract

Background

Most of the morbidity and mortality in AIDS cases result from Opportunistic Infections. Identification of such pathogens is very important for clinicians and health planners to tackle the AIDS epidemic in more effective manner.

Objectives

To find out the prevalence and spectrum of Opportunistic Infections among PLHIV on ART attending GMC, Jammu.

Materials and Methods

Hospital-based, cross-sectional study conducted on OPD patients attending ART Centre. The patients were enrolled in the study based on inclusion and exclusion criteria. They were interviewed and the information was collected about socio-demographic profile, risk behavior, treatment adherence. Clinical details and treatment records were also studied.

Results

A total of 200 HIV positive patients with OIs were interviewed and about 210 opportunistic infections were found among them as some of them had more than one OIs. The mean age of the study participants was 40.25 years with a Standard Deviation of 11.14 years. The prevalence of OIs was found to be 7% (210/3000). The commonest OI encountered was Tuberculosis (TB) which included pulmonary TB and Extra pulmonary TB (49%) followed by Candidiasis (24.8%) and Diarrhea (11.4%). Variables which had a statistically significant association with OIs were gender, residence, risk behavior ($p < 0.05$).

Conclusions Almost 7% of the HIV positive patients were diagnosed with OIs. Tuberculosis was the most frequent OI among the PLHIV. This necessitates for accurate and timely diagnosis, to ensure proper care and treatment.

Practitioner2024;2(4):28-33.

Introduction

Acquired immunodeficiency syndrome (AIDS) is potentially a fatal illness caused by a retrovirus known as human immunodeficiency virus (HIV) which breaks down the body's immune system, leaving the victim vulnerable to a risk of life threatening opportunistic infections, neurological disorders or unusual malignancies[1]. The current estimate of the number of cases of HIV infection worldwide is 37.9 million, and among them 28.2 million are on anti-retroviral treatment. The number of

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Indexed

EMBASE, SCOPUS , IndMED, ESBCO, Google Scholar besides other national and International databases.

Cite this article as

Nazir H , Bahl R , Kumari R ,Lateef EI. Prevalence and Spectrum of Opportunistic Infections (OIs) Among HIV Positive Cases on Anti Retroviral Therapy (ART) Attending ART Centre Government Medical College (GMC), Jammu in Northern India.
JK Pract2024;29(4):28-33.

Full length article available at jkpractitioner.com one month after publication

Keywords

HIV, AIDS, opportunistic infections (OIs), anti retroviral therapy (ART).

new infections in 2020 was 1.5 million and there were 6,80,000 cases of AIDS-related illnesses. Since the start of the epidemic 79.3 million people have become infected with HIV and 36.3 million people have died from AIDS-related illnesses[2]. Jammu and Kashmir is considered as a low prevalence region for AIDS, where only 0.06 per cent people have been registered HIV-positive out of approximately two million patients in India.

The threat to life is not from the virus alone. Opportunistic infections and associated complications amount to a considerable proportion of such mortality. Opportunistic infections (OIs) are defined as infections that are more frequent or more severe because of immune suppression in HIV-infected patients, and they are the major clinical manifestation of HIV patients[3]. Occurrence of life threatening OIs, malignancies, neurological diseases and other specific illnesses in patients with HIV infection and CD4 counts <200 cells/cu mm leads to development of AIDS. Appearance of many OIs correlates with the CD4 counts. Tuberculosis generally develops at CD4 counts of 200-500 cells/cu mm as does Candida albicans infection. Pneumocystis jirovecii pneumonia (PCP, earlier known as Pneumocystis carinii) and Diarrhea generally occurs at CD4 counts <200 cells/cu mm and Cytomegalovirus (CMV) infection occurs when the CD4 count falls below 50 cells/cu mm[4].

Hence, this study was conducted with the objectives to estimate the prevalence of OIs and spectrum of OIs among HIV positive cases on ART attending tertiary care institute in Northern India.

Materials and Methods

Study Design and Setting- A cross-sectional, hospital-based study was conducted on OPD patients, attending ART Centre of a tertiary care institute in North India.

Sampling Method- Consecutive sampling method was adopted. All patients aged 18 years and above diagnosed as HIV positive according to NACO guidelines and with OIs attending ART Centre were included in the study.

Source of Data- The participants selected for study were the HIV positive cases attending the ART Centre, Government Medical College, Jammu.

Study Period- One year with effect from 1st November 2019-31st October 2020.

Ethical Consideration- A clearance from the Institutional Ethical Committee of Government Medical College, Jammu was sought before the commencement of study.

Inclusion Criteria-

- All patients aged 18 years and above diagnosed as HIV positive according to NACO guidelines and with OIs attending ART centre were included in the study.

- Patients referred to ART Centre from various peripheral health institutions.

Exclusion Criteria-

- Patients harboring OIs who are immune suppressed because of causes such as malignancies, organ transplant, patients on steroid therapy or immunosuppressive therapy, diabetes mellitus etc. other than HIV.
- Patients who don't consent for being included in the study.
- Children below the age of 18 years.

Procedure-

HIV Positive cases showing the evidence of OIs were enrolled in the study. Attempt was made to extract information from the attendants of debilitated or sick patients and in cases where it was not feasible, they were excluded. The patients were interviewed and the information was collected about socio-demographic profile, risk behavior, adherence to treatment. In addition the patient's medical record was studied to find the details of clinical presentation, treatment, investigations, pertaining to OIs. The general physical examination (GPE) was conducted jointly by the investigator and the medical officer and the findings were recorded accordingly. All the cases of OIs captured by the investigator were enrolled as subjects for the study purpose.

Diagnostic Criteria for Opportunistic Infections-The clinical assessment and examination of cases was performed by medical officers and senior medical officer of ART Centre. CD4 cell count is advised as baseline and at every 6 months and other specific laboratory investigations are prescribed on case to case basis. Patients were evaluated for various opportunistic infections. A specific opportunistic infection was diagnosed on the basis of standard clinical definition and laboratory procedures which are available in the institution.

Tools for Research- A structured proforma was prepared and some of the information was taken from the treatment record of the patient issued by the ART Centre which included Socio-demographic profile, History of risk behavior, General physical examination, Laboratory investigations, Radiological investigations and Final diagnosis.

Statistical Analysis- Data thus collected was entered into a master chart on Microsoft Excel spread sheet. The prevalence of Opportunistic infections and spectrum of OIs was calculated in terms of percentages (%). The results were studied in terms of numbers, proportions, means, Standard deviations. P value <0.05 was considered as statistically significant.

Results

A study to estimate Prevalence and Pattern of Opportunistic Infections among people living with HIV/AIDS (PLWHA) attending antiretroviral therapy (ART) Centre, Government Medical College, Jammu was conducted on 200 HIV positive/AIDS patients during a period of one year from November 1st, 2019 to October 31st, 2020. Total number of OPD patients who visited during this time were 3000. Among them total number of patients with OIs seen were 200. Total number of OIs found were 210 (some patients had more than one OIs). The mean age of the study population was 40.25 ± 11.14 years. Males constituted 69.5% of the study subjects. A larger proportion of participants hailed from rural background (71%). 64.5% of the study subjects were married. 28% of the patients were engaged in private jobs. 29.5% included all males belonging to the occupations keeping them away from their families for long periods. 28% of the female patients were house wives. 44% of the patients were educated only up to primary level and 21.5% of the patients were illiterate and only 4% of the patients were educated above graduate level. The distribution and prevalence of OIs among HIV positive cases according to socio-demographic variables is detailed in Table 1.

An absolute majority of patients (84.5%) gave history suggestive of heterosexual transmission of infection. A meager proportion of 4.5% had possibly contracted the infection through contaminated blood transfusion, mother to child (2.5%), injecting drug use (1.5%) and men having sex with men (0.5%). 6.5% of the patients had unknown mode of exposure (Table 2). The prevalence of OIs was found to be 7% (Table 3). Commonest OI seen was TB (49.05%) which included both pulmonary TB (28.10%) and extrapulmonary TB (20.95%), followed by Candidiasis (24.8%) and Diarrhea (11.4%) (Table 4). Variables which had a statistically significant association with OIs were gender, residence, risk behavior ($p < 0.05$).

Discussion

Out of 3000 HIV positive cases attending ART Centre, Jammu during a period of 1 year (Nov 1; 2019 to Oct 31; 2020) 200 patients were diagnosed with Opportunistic infections. Total prevalence of OIs (210) among HIV positive cases was about 7%. Prevalence of TB was seen to be 3.44% including 1.97% of PTB and 1.47% of EPTB; 1.73% of Candidiasis; 0.8% of Diarrhea and 1.03% Others. It is much lower in contrast to the findings of other studies conducted in India and abroad, which showed higher prevalence of OIs among HIV positive patients, [5,6,7,8,9,10,11,12]. It could be due to the fact that prevalence of HIV in general is very low in Jammu & Kashmir being a low prevalent State and all the study participants happened to be on ART in

the locally available ART centers. The patients are more compliant to ART and prophylactic antibiotics.

As we discuss spectrum of OIs in our patients, it is important to mention here that there was more than one OIs present in many patients. The commonest OI encountered in the present study was Tuberculosis (49%, $n=103/210$) which included pulmonary

Table 1: Distribution and Prevalence of OIs among HIV positive cases according to Socio-demographic variables.

Characteristics	Number (n)	Percentage (%)
Age		
<20	4	2%
20-30	37	18.5%
30-40	75	37.5%
40-50	50	25%
50-60	26	13%
>60	8	4%
Gender		
Male	139	69.5%
Female	60	30%
Transgender/Transsexual	1	0.5%
Residence		
Rural	142	71%
Urban	58	29%
Religion		
Hindu	167	83.5%
Muslim	16	8%
Sikh	17	8.5%
Marital status		
Married	129	64.5%
Unmarried	39	19.5%
Widowed	26	13%
Divorced/separated	5	2.5%
Live-In relationship	1	0.5%
Occupation		
Govt. job	12	6%
Army/Paramilitary	5	2.5%
Private job	56	28%
Driver	26	13%
Labourer	28	14%
Home maker	56	28%
Businessman	17	8.5%
Level of education		
Illiterate	43	21.5%
Primary	88	44%
Secondary	37	18.5%
Higher secondary	12	6%
Graduate	12	6%
Above	8	4%

Table 2: Distribution of cases on the basis of risk behaviour

Mode of exposure	No. of Cases	%age
Heterosexual	169	84.5%
MSM	1	0.5%
Injecting drug use(IDU)	3	1.5%
Blood transfusion	9	4.5%
Mother to child	5	2.5%
Unknown	13	6.5%
Total	200	100%

Table 3: Prevalence of OIS (N=3000) (210/3000×100=7)

OIs	No. of Cases	%age
PTB	59	1.97%
Candidiasis	52	1.73%
EPTB	44	1.47%
Diarrhea	24	0.8%
Others*	31	1.03%
Total	210	7%

*Others: include PCP, pneumococcal pneumonia, seborrhoeic dermatitis, dermatophytosis, Herpes zoster, HIV encephalopathy, HIV-associated cardiomyopathy, aspergillosis, cryptococcal meningitis, molluscum contagiosum, giardiasis, CMV retinitis.

tuberculosis (PTB=28.10%, n=59/210) and extrapulmonary tuberculosis (EPTB=20.95%, n=44/210). The next common OI seen was Candidiasis (24.8%, n=52/210) which included 50 cases of oral candidiasis and 2 cases of esophageal candidiasis, followed by Diarrhea (11.4%, n=24/210). Pneumocystis carinii pneumonia was diagnosed in 5 (2.38%) patients. Pneumococcal pneumonia was seen in 5 (2.38%) patients and Seborrhoeic dermatitis also in 5 (2.38%) patients. Herpes zoster was seen in 4 (1.90%) patients and HIV encephalopathy in 3 (1.43%) patients.

Table 4: Distribution of cases on the basis of opportunistic infections (OIs)

Opportunistic infection ^a	No. of Cases	%age
PTB	59	28.10%
Candidiasis*	52	24.76%
EPTB	44	20.95%
Diarrhoea	24	11.43%
PCP	5	2.38%
Pneumococcal pneumonia	5	2.38%
Seborrhoeic dermatitis	5	2.38%
Herpes zoster	4	1.90%
HIV encephalopathy	3	1.43%
Dermatophytosis	2	0.95%
HIV associated cardiomyopathy	2	0.95%
Aspergillosis	1	0.48%
Cryptococcal meningitis	1	0.48%
Molluscum contagiosum	1	0.48%
Giardiasis	1	0.48%
CMV retinitis	1	0.48%
Total	210	100%

*Oral candidiasis was present in 50 cases and 2 cases had esophageal candidiasis.

^a More than one opportunistic infection present in patients

Dermatophytosis was diagnosed in 2 (0.95%) patients and HIV-associated Cardiomyopathy in 2 (0.95%) patients. Aspergillosis was seen in one (0.48%) patient

and Cryptococcal meningitis was seen in one (0.48%) patient. One patient presented with Molluscum contagiosum, one had Giardiasis, and one had CMV retinitis. Rahul Rathee et al. (2017)[13], in their study on 3280 HIV Seropositive patients at ART Centre, PGIMS, Rohtak, reported Tuberculosis (49.80%) to be the commonest OI, followed by candidiasis with 18.80% cases. Other OIs reported were diarrhoea, bacterial infections (respiratory), herpes zoster, cryptococcal meningitis, pneumocystis carinii pneumonia (PCP), CMV retinitis and herpes simplex with a distribution of 11.95%, 8.80%, 1.46%, 0.57%, 0.33%, 0.27% and 0.12% respectively which is fairly consistent with our results. The findings are comparable with our results, and the participants were registered in the ART centre. They all were on ART, and being on ART could be one reason that the prevalence was low in the present study as well as the other study (Rahul Rathee et al. 2017),[13]. Tuberculosis, candidiasis and diarrhoea were the most commonly reported OIs in various studies[5,14,15,16,17,18]. Various Indian studies have reported TB as the most common OI, like the study by Kumaraswamy et al. (1995), which reported 46% cases of TB, Sircar et al. (1998)[19] reported 58.4% cases; Ayyagari et al. (1999) reported 36% cases. Vajpayee et al. (2003), in a study of 421 HIV-infected patients in North India, reported 47% of cases of TB. Agrawal et al. (2002) too, in their study in New Delhi, reported TB to be the most common OI seen in 38.75% of cases. Chakravarty et al. (2006), in their study of 438 HIV-positive patients in IMS, BHU Varanasi, reported TB to be the commonest OI (38.8%), followed by oropharyngeal candidiasis (20.3%) and diarrhoea (12.7%), very close to our figures.

Conclusion

The prevalence and spectrum of OIs were discussed in this study. The most common OI encountered was Tuberculosis followed by Candidiasis and Diarrhea. It would help increase the awareness for physicians to make a diagnosis and empirical treatment sooner and plan good management strategies, especially in resource limited settings.

Financial support and sponsorship: Nil

Conflicts of interest: There are no conflicts of interest

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