Original Article

Clinical and Demographic Profile of Newly Diagnosed HIV/AIDS Patients Attending ART Clinic, North Bengal Medical College and Hospital, Darjeeling District, West Bengal

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Abstract

Background: AIDS was first recognized in 1981 in the USA among high-risk groups, later linked to HIV isolation in 1983–84. In India, first case appeared in 1986, with rapid spread among high-risk groups and general population. Estimated burden reached 2–3 million, later about 2.1 million in 2015, with prevalence around 0.3–0.36%. Globally, about 33.3 million people live with HIV, mostly in developing countries. Transmission is mainly heterosexual (87.1%), with other routes including parent-to-child, IDU, and blood exposure, affecting productive age groups. The study aims to assess the demographic and clinical profile of newly diagnosed HIV/AIDS patients attending ART centre at NBMCH, including seropositive cases (2016–2017), age and sex distribution, transmission modes, residence and occupation, clinical features, opportunistic infections, and baseline CD4 count at presentation. **Material and Methods:** This hospital-based descriptive study included 400 newly diagnosed HIV/AIDS patients attending ART Clinic, NBMCH, Darjeeling. Data on age, sex, residence, occupation, transmission mode, clinical features, CD4 count, and opportunistic infections were collected using a structured proforma. Results were analyzed using descriptive statistics and presented as frequencies and percentages. **Results:** Tuberculosis was the most common opportunistic infection in HIV patients (28.75%), followed by oral candidiasis (20.50%). Sputum-positive pulmonary TB occurred in 31 patients (7.75%), mostly with CD4 100–250. Most opportunistic infections increased as CD4 count decreased, with severe infections like cryptococcosis and toxoplasmosis seen mainly at CD4 <100. **Conclusion:** HIV infection is more common in males and sexually active young adults, mainly transmitted through heterosexual contact. Migration, occupation (drivers, labourers, sex workers), low literacy, and poor awareness contribute to spread. Common symptoms include fever, with tuberculosis and oral candidiasis as frequent opportunistic infections related to CD4 count. Urban populations are more affected.

Keywords: HIV/AIDS, ART clinic, demographic profile, clinical profile, opportunistic infections, CD4 count.

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Introduction

AIDS (Acquired ImmunoDeficiency Syndrome) was first recognized in the United States in the summer of 1981, when the U.S. Centers for Disease Control and Prevention reported unexplained Pneumocystis jiroveci pneumonia and Kaposi's sarcoma in healthy homosexual men in New York and Los Angeles, later extending to injection drug users, blood transfusion recipients and haemophiliacs, indicating a transmissible infectious agent; HIV was isolated in 1983 and confirmed causative in 1984.[1]

In India HIV was first detected in commercial sex workers in Tamil Nadu in 1986 and since then the infection has grown rapidly, with 2006 estimates showing national adult prevalence of 0.36 percent (2–3.1 million people), female 0.29 percent, male 0.43 percent, and 88.7 percent infections in age 15–49; high-risk groups include IDUs 8.71 percent, MSM 5.69 percent and FSWs 5.38 percent.[2]

The epidemic in India varies widely across regions, notably Manipur with epidemic proportions among IDUs, and has shifted from high-risk groups to the general population including monogamous women through infected spouses, influenced by poverty, urbanization, migrant slums, low income, lack of condom access, illiteracy, and untreated STDs increasing transmission risk.[3-9]

High HIV prevalence states include Maharashtra, Tamil Nadu, Karnataka, Andhra Pradesh, Manipur and Nagaland (≥1% antenatal prevalence), moderate states Gujarat, Goa and Pondicherry (≥5% in high-risk groups but <1% antenatal), and low prevalence states where rates remain below 5% in high-risk groups and <1% antenatal.[10]

NACO reports heterosexual transmission as the major route 87.1%, followed by parent-to-child 5.4%, IDU 1.6%, homosexual 1.5%, blood transfusion 1%, and unknown 3.3%.[11]

Globally, UNAIDS/WHO 2010 estimated 33.3 million people

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living with HIV (0.8% prevalence), with 4.1 million in South and South-East Asia; about 90% occur in developing countries, India contributing 2.31 million cases (0.3%).[12] NACO 2015 reported 2.1 million cases; India third globally. The study aimed to evaluate the study aimed to evaluate the demographic and clinical profile of newly diagnosed HIV/AIDS patients at a tertiary care centre, including age, sex, transmission routes, residence, occupation, presenting symptoms, opportunistic infections, and baseline CD4 counts at presentation.[13-15]

Materials and Methods

Study design: Observational study

Place of study: North Bengal medical college and hospital, Sushrut Nagar, Darjeeling

Period of study: April 2016 to March 2017

Study Population: The outdoor and indoor patients with newly diagnosed HIV/AIDS disease attending ART (Nodal) centre and Department of General Medicine, North Bengal Medical College & Hospital.

Sample size: 400 patients

Inclusion Criteria:

- The participants included were Newly diagnosed HIV/AIDS patients.
- Not on ART.
- Attending NBMCH

Exclusion criteria:

- Patient's refusal to give consent for the study.

Study Variable:

Demographic Variables

- Age
- Gender
- Residence (Rural/Urban)
- Occupation
- Educational status
- Marital status

Clinical Variables

- Mode of HIV transmission
- Presenting signs and symptoms
- Opportunistic infections
- Baseline CD4 count
- WHO clinical stage of HIV disease
- Nutritional status (if available)

Treatment-Related Variables

- Newly diagnosed HIV seropositive status
- Registration at ART clinic
- Eligibility/initiation of ART (if assessed)

Statistical Analysis: For statistical analysis, data were initially entered into a Microsoft Excel spreadsheet and then analysed using SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and GraphPad Prism (version 5). Numerical variables were summarized using means and standard deviations, while Data were entered into Excel and analyzed using SPSS and GraphPad Prism. Numerical variables were summarized using means and standard deviations, while categorical variables were described with counts and percentages. Two-sample t-tests were used to compare independent groups, while paired t-tests accounted for correlations in paired data. Chi-square tests (including Fisher's exact test for small sample sizes) were used for categorical data comparisons. P-values ≤ 0.05 were considered statistically significant.

Results

Table 1: Combined Gender-wise Distribution of Study Population (n = 400)

Variable	Category	Total Number (%)	Male (n = 237) (%)	Female (n = 148) (%)	Transgender (n = 15) (%)
Gender	Male	237 (59.25%)	237 (100%)	0 (0.00%)	0 (0.00%)
	Female	148 (37.00%)	0 (0.00%)	148 (100%)	0 (0.00%)
	Transgender	15 (3.75%)	0 (0.00%)	0 (0.00%)	15 (100%)
Age group	Age (0–10)	29 (7.25%)	18 (7.59%)	11 (7.43%)	0 (0.00%)
	Age (>10–20)	16 (4.00%)	13 (5.49%)	3 (2.03%)	0 (0.00%)
	Age (>20–30)	107 (26.75%)	67 (28.27%)	34 (22.97%)	6 (40.00%)
	Age (>30–40)	150 (37.50%)	85 (35.86%)	57 (38.51%)	8 (53.33%)
	Age (>40–50)	47 (11.75%)	27 (11.39%)	20 (13.51%)	0 (0.00%)
	Age (>50–60)	33 (8.25%)	16 (6.75%)	16 (10.81%)	1 (6.67%)
	Age (>60)	18 (4.50%)	11 (4.64%)	7 (4.73%)	0 (0.00%)
Residence	Urban	248 (62.00%)	148 (62.45%)	92 (62.16%)	8 (53.33%)
	Semi-Urban	64 (16.00%)	38 (16.03%)	24 (16.22%)	2 (13.33%)
	Rural	88 (22.00%)	51 (21.52%)	32 (21.62%)	5 (33.33%)
Profession	Manual Labourers	66 (16.50%)	65 (27.43%)	1 (0.68%)	0 (0.00%)
	Driver	73 (18.25%)	73 (30.80%)	0 (0.00%)	0 (0.00%)
	Servicemen	11 (2.75%)	11 (4.64%)	0 (0.00%)	0 (0.00%)
	Businessmen	18 (4.50%)	18 (7.59%)	0 (0.00%)	0 (0.00%)
	Student (School & College)	29 (7.25%)	19 (8.02%)	10 (6.76%)	0 (0.00%)
	Army Personnel	13 (3.25%)	13 (5.49%)	0 (0.00%)	0 (0.00%)
	Unemployed	3 (0.75%)	3 (1.27%)	0 (0.00%)	0 (0.00%)
	Commercial Sex Worker	65 (16.25%)	1 (0.42%)	64 (43.24%)	0 (0.00%)
	Pre-School Child	26 (6.50%)	16 (6.75%)	10 (6.76%)	0 (0.00%)
	House wife	62 (15.50%)	0 (0.00%)	62 (41.89%)	0 (0.00%)
	Others	26 (6.50%)	10 (4.22%)	1 (0.68%)	15 (100%)
	Farmer	8 (2.00%)	8 (3.38%)	0 (0.00%)	0 (0.00%)

Table 2: Mode of Transmission of HIV in Study Population

Mode of Transmission of HIV in Study Population (n = 400)	
Type	**Total Number (%)**
Heterosexual	263 (65.75%)
Mother to Child	30 (7.50%)
MSM	7 (1.75%)
IV Drug User	37 (9.25%)
Blood Transfusion	26 (6.50%)
Unknown	37 (9.25%)

Table 3: Distribution of CD4+ T-Cell Count in Study Population

Distribution of CD4+ T-Cell Count in Study Population (n = 400)	
Range	**Total Number (%)**
0 - 100	56 (14.00%)
> 100 - 250	197 (49.25%)
> 250 - 500	102 (25.50%)
> 500	45 (11.25%)

Table 4: Distribution of Association of Tuberculosis with HIV according to CD4+ T-Cell Count in Study Population

Distribution of Association of Tuberculosis with HIV according to CD4+ T-Cell Count in Study Population (n = 400)					
Opportunistic Infection		**CD4 Count**			
Type	**Total Number (%)**	**> 0 - 100**	**> 100 - 250**	**> 250 - 500**	**> 500**
Sputum Positive Pulmonary Tuberculosis	31 (7.75%)	8	20	3	0
Tubercular Pleural Effusion	20 (5.00%)	6	11	3	0
Tuberculous Peritonitis	15 (3.75%)	0	12	3	0
Tuberculous Meningitis	12 (3.00%)	2	10	0	0
Pott's Spine	10 (2.50%)	4	6	0	0
Sputum Negative Pulmonary Tuberculosis	9 (2.25%)	3	6	0	0
Tuberculous Lymphadenitis	9 (2.25%)	1	7	1	0
Disseminated tuberculosis	4 (1.00%)	2	2	0	0
Tuberculous pericardial effusion	3 (0.75%)	0	3	0	0
BM TB	1 (0.25%)	1	0	0	0
Tuberculous Osteomyelitis	1 (0.25%)	1	0	0	0

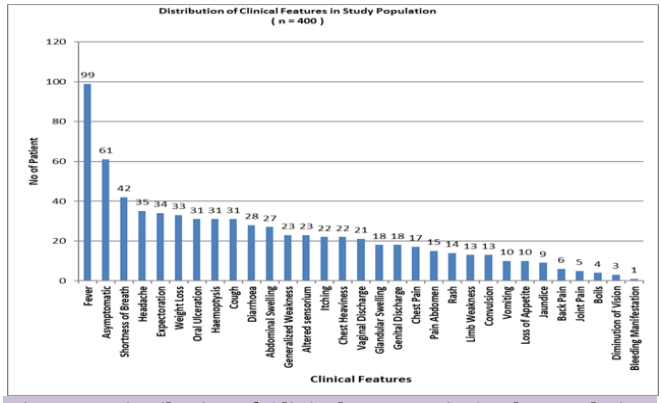

Figure 1: Distribution of Clinical Features in Study Population

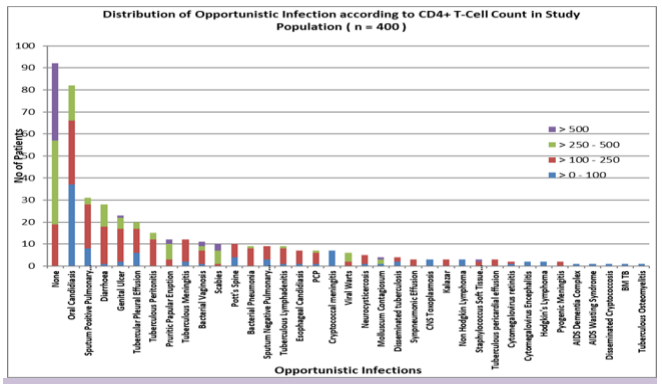

Figure 2: Distribution of Opportunistic Infection according to CD4+ T-Cell Count in Study Population

That out of 400 seropositive patients, the number of male patients in the study population were 237 (59.25%). The female patients were 148(37.00%) and the transgender patients were 15(3.75%). (Gender)

The total number of the patients within the age group 30-40 years was 150(37.50%), 85(35.86%) of them were males and 57 (38.51%) were females, and 8(53.33%) of them were transgender. The number of patients in age group 20-30 years was 107(26.75%). Gender wise distribution amongst them were 67(28.27%) males, 34(22.97%) females and 6(40%) transgenders. The total number of patients and their percentage wise distribution in all genders were highest in age group 30-40 years (37.5%), followed by 20-30 years (26.75%). Whereas the patients in age group 10-20 years and 60 years above were 16 (4%) and 18(4.5%) respectively, which is less than the sexually active group. This shows that the sexually active group in all the genders were much more affected than the other age groups in the study population. (Age in group)

The urban population constituted of 248(62.00%) patients, 148(62.45%) males, 92(62.16%) females and 8 transgenders. 64(16.00%) belonged to the semiurban area. Among them 38(16.03%) were males, 24(16.22%) females and 2(13.11%) transgenders.

A total of 88 (22.00%) patients belonged to the rural area, 51 (21.25) were males, 32 (21.62%) were females and 5 (33.33%) were transgender. [Residence]

66 (16.50%) patients were manual labourers, 73 (18.25%) were drivers, 11 (2.75%) servicemen, 18 (4.50%) patients were

businessmen, 29 (7.25%) were students, 13 (3.25%) were army personnel and 3 (0.75%) of the patients were unemployed.

65 (16.25%) patients were commercial sex worker. Preschool children was 26 in number which constitutes 6.50% of the total study population. 62 (15.50%) patients were housewives. 26 (6.50%) patients of the study population belonged to other profession. 18 (3.38%) patients were farmers by profession.

Hence most of the male patients newly diagnosed with HIV were drivers (18.25%) followed by manual labourers (16.50%). Among the female patients most of them were commercial sex workers (43.24%) closely followed by housewives (41.89%). [Profession]

The most common mode of transmission was heterosexual i.e. 263 (65.75%) patients. Mother to child transmission occurred in 30 (7.50%) cases. Men having sex with men formed only 7 (1.75%) cases. The number of IV drug abuser were 37 (9.25%) in number. 26 (6.50%) patients gave history of requiring previous blood transfusion. The mode of transmission was unknown in 37 patients (9.25%).

Hence the commonest mode of transmission in newly diagnosed HIV patients were heterosexual followed by IV drug abuser & unknown. [Table 2]

Most of the patients attending our hospital, i.e., 197 (49.25%) had a CD4 count between >100-250 and 102(25.50%) patients had their CD4 cell count within the range of >250-500.

Only 45(11.25%) patients had >500 CD4 cell count at presentation.

This shows that most of the newly diagnosed patients had a CD4 cell count range of >100-250 followed by >250-500. [Table 3]

Depicts Distribution of Association of Tuberculosis with HIV according to CD4+ T-Cell Count in Study Population.

Sputum positive Pulmonary Tuberculosis was reported in 31(7.75%) patients, 8 of them had a CD4 cell count within 0-100,20 of them had a CD4 cell count of >100-250,3 of them had a CD4 cell count of >250-500. Tubercular pleural effusion was detected in 20(5.00%) patients, majority of them had a CD4 cell count between >100-250.

Sputum Negative Pulmonary Tuberculosis was seen only in 9(2.25%) cases, majority of the patients had a CD4 cell count of >100-250. Tuberculous lymphadenitis was reported in 9(2.25%) patients, 1 patient had a CD4 cell count of >0-100,7 patients with Tuberculous lymphadenitis had a CD4 cell count of 100-250,1 patient with Tuberculous lymphadenitis had a CD4 cell count of >250-500. Disseminated Tuberculosis was seen in 4(1.00%) patients,2 of the patients with Disseminated Tuberculosis had a CD4 cell count of >0-100 and the other 2 patients had a CD4 cell count of >100-250. Tuberculous pericardial effusion was seen only in 3 (0.75%) patients and all of them had a CD 4 cell count of >100-250.

Bone marrow Tuberculosis was seen in 1(0.25%) patient, the patient had a CD4 cell count of >0-100.

Hence Sputum positive Pulmonary Tuberculosis was the most common presentation of Tuberculosis in our study population followed by Tubercular pleural effusion. Most of the patients with Tuberculosis had a CD4 cell count between 100-250. [Table 4]

The number of patients having various symptoms were much higher than asymptomatic patients, i.e., 339 (84.75%) versus 61 (15.25%). Fever was the commonest presentation, i.e., in 99 (24.75%) patients, followed by shortness of breath in 42 (10.50%) of the patients. [Figure 1]

Depicts the distribution of the opportunistic infection according to CD4 cell count in the study population. 92(23.00%) patients did not have any evidence of opportunistic infection at initial presentation, amongst them 19 patients had CD4 cell count range of >100-250, 38 patients had a CD4 cell count of >250-500 and 35 patients had a CD4 cell count of >500.

Most common opportunistic infection seen was Tuberculosis 115 (28.75%) followed by Oral Candidiasis 82(20.50%).

Sputum positive Pulmonary Tuberculosis was seen in 31 (7.75%) patients, amongst them 8 patients had a CD4 cell count within >0-100, 20 of them had a CD4 cell count of >100-250 and 3 of them had a CD4 cell count of >250-500. So, majority of the Sputum positive pulmonary Tuberculosis had a CD4 cell count between 100 to 250. Sputum negative Pulmonary Tuberculosis was seen in 9(2.25%) cases,3 of the patients had a CD4 cell count of >0-100,6 of those patients had a CD4 cell count of >100-250.

Other dreaded OI's like Pneumocystis carinii pneumonia was seen in 7 (1.75%) patients,1 of them had CD4 cell count of >0-100,5 patients with Pneumocystis carinii pneumonia had a CD4 cell count of >100-250 and only 1 patient had a cell count of >250-500.Cryptococcal meningitis was seen in 7(1.75%) patients, all of them had a CD4 cell count of less than 100. CNS Toxoplasmosis was seen in 3(0.75%) of the patients, all of them had a CD4 cell count of >0-100. Cytomegalovirus Retinitis was seen in 2 patients (0.50%),1 patient had a CD4 cell count of >0-100 and another patient had a CD4 cell count of >100-250.

Hence the most common opportunistic infection was Tuberculosis followed by Oral Candidiasis. The number of opportunistic infections were inversely related to the CD-4 cell count and a CD-4 cell count of 0-100 was associated with rare opportunistic infection. [Figure 2]

Discussion

The present study demonstrated that tuberculosis (TB) remains the most common opportunistic infection among HIV/AIDS patients, with sputum-positive pulmonary TB being the predominant form (7.75%), followed by tubercular pleural effusion and sputum-negative pulmonary TB. This finding is consistent with Sharma SK et al,[16] who reported a wide spectrum of clinical disease in hospitalized HIV-infected patients from North India, with tuberculosis being the most frequent opportunistic infection.

Most TB cases in the present study occurred in patients with CD4 counts between 100–250 cells/mm³, showing an inverse relationship between CD4 level and infection severity. This is supported by Sawhney MP et al,[17] who observed that many HIV cases are diagnosed through opportunistic infections, particularly tuberculosis, indicating advanced immunosuppression at presentation.

Rewari BB et al,[18] reported that opportunistic infections and emergencies in HIV patients increase significantly with declining

CD4 counts, especially below 200 cells/mm³, which aligns with the immunological pattern observed in the present study.

Chakraborty MS et al,[19] emphasized the strong association between tuberculosis and HIV infection, noting that TB is the most common opportunistic infection in Indian HIV patients and often varies in clinical presentation depending on immune status, which correlates with our findings.

Chacko S et al,[20] described the clinical profile of AIDS patients in India, highlighting fever, respiratory symptoms, tuberculosis, and oral candidiasis as the most common presentations, with advanced disease associated with severe opportunistic infections such as cryptococcosis and CNS involvement, supporting the present study results.

Conclusion

HIV infection is more common in males in comparison to the females. Young people remain at the centre of the HIV /AIDS epidemics in terms of rates of infection. Sexually active groups are mainly predisposed to the disease acquisition and transmission as the most common mode of transmission is the heterosexual route. The need of migration for livelihood is one important factor contributing towards the spread of HIV infection, as most of the male subjects in the study groups were drivers and labourers. Similarly in female subjects, most of them were commercial sex workers. Heterosexual mode of transmission is the most common route of HIV transmission. HIV infected patients may be symptomatic or asymptomatic. Amongst the symptomatic patients, fever is the most common presenting symptom. Various opportunistic infections are seen in HIV, usually related to the CD4 cell count of the individual. Tuberculosis is the most commonest OI followed by Oral Candidiasis. Fatal infections like PCP, Cryptococosis and CNS Toxoplasmosis are seen in patients with lower CD4 cell counts. The disease is more common in urban and semi urban population. HIV infection is commonly seen in low literacy groups , most of them have just primary school education . This has an additional effect on disease transmission as most of the people lack awareness and knowledge regarding HIV. The most important way to prevent disease transmission is to raise the level of knowledge about HIV transmission and how to be protected against the disease.

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Conflicts of interest

There are no conflicts of interest.

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