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Age and Opportunistic Infections: Prevalence and Predictors among Older People Living With HIV

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ABSTRACT

Objectives: To document prevalence of opportunistic infections (OI) among older people living with HIV and to assess predictors of opportunistic infections among older people living with HIV.

Methods: A retrospective cohort study was conducted on records of 190 alive older people living with HIV (PLHIV) aged 50 years or more on ART at ART centre, New Civil Hospital, Surat. Sociodemographic variables, WHO stage, CD4 count and OIs were studied.

Statistical analysis: Data was analysed by SPSS software to calculate frequencies and measures of central tendencies. Logistic Regression model was applied.

Results: Participants mean age was 57.89 ±5.45 years, 66.84% were males. Heterosexual route was major route of HIV transmission. Prevalence of OIs was 63.7%; with Tuberculosis 22.1% most common, followed by ARI 17.2% and Oral candidiasis 13.2%. Baseline WHO clinical stage III (OR: 8.2; CI: 2.873-23.870) and IV (OR:21.7; CI: 3.83-122.90), Baseline CD4 <200 cells/cumm (OR:3.7; CI:1.10-12.11), weight <50kg in last visit (OR:2.9; CI: 1.07-8.23)were predictors of OIs among older PLHIV.

Conclusion: Low CD4 count and higher stage of disease at initiation of ART, weight <50kg in last visit are predictors for OI by Logistic Regression model

Key words: HIV, Opportunistic Infection, Older PLHIV, WHO stage

INTRODUCTION

In 2015, there were 36.7 million [34.0 million–39.8 million] people living with HIV.[1] There are 4.2 million people aged 50 and older are living with HIV today. Thirteen percent of the global adult population living with HIV is aged 50 or older. UNAIDS highlights the main reasons older people are being left behind in the HIV response: a) Low perception of HIV risk, b) Complications of managing HIV and other health issues, c) Access to services d) Stigma and discrimination. The report highlights that older people remain sexually active but levels of condom use are low. UNAIDS highlights the need for early HIV detection and treatment. We know that older people are less likely to test for HIV, and therefore may be diagnosed late, making treatment less effective.[2]

A higher proportion of older patients were male, reported heterosexual or unknown HIV risk exposure, were never tested for HIV before and were in a more advanced stage of HIV infection at diagnosis, as compared with their younger counterparts.[3]

Higher morbidity and mortality associated with HIV because of underlying immunosuppression which leads to life threatening opportunistic infections (OIs) during the natural course of the

disease.[4] The widespread use of ART has the most profound influence on reducing OI-related mortality in HIV-infected persons. However, OIs continue to cause morbidity and mortality in HIV/AIDS patients even after ART. Some patients do not have a sustained response to antiretroviral agents for multiple reasons including poor adherence, drug toxicities, drug interactions. Therefore, OIs continue to cause substantial morbidity and mortality in patients with HIV infection despite use of ART.[5]

There are many studies conducted to see prevalence of opportunistic infections, studies about opportunistic infection among 50 years or more are very few. This study was conducted to document prevalence and types of opportunistic infections in older HIV positive people, to determine the association between risk factors and opportunistic infections and to find factors affecting opportunistic infections among 50 years or more aged PLHIV.

MATERIAL AND METHODS

The retrospective cohort study was conducted at ART centre, New Civil Hospital, Surat in Gujarat in November 2015. The cohort consisted of patients enrolled in the ART Care and Support from the January 2010 to January 2015. In this study, we have defined PLHIV aged 50 years or more as an older PLHIV. Out of 496 HIV positive, 190(38.30%) who were 50 years or more in age were enrolled in the study. The inclusion criteria for the study were as follow: study participants were 50 years or more in age, alive and registered between January-2010 to January-2015. Fifty years or more who were loss to follow up, transferred out or death were excluded from study. Data was entered in MS Excel and analysed by SPSS. Frequency for qualitative variables and mean for quantitative variables were calculated. Binary logistic regression was applied to find predictors of opportunistic infections (OIs).

Study Variables Information about variables like opportunistic infections and socio-demographic characteristics, baseline CD4 count and last visit , baseline WHO stage and last visit , weight recorded during baseline and last visit, transmission route were obtained from records available at ART centre.

Confidentiality of the participants This was a retrospective cohort study using programmatic data. Unique ID was generated for all available case records. Personal identifiers were discarded during analysis.

RESULTS

A total of 190 older PLHIV were included in this study. The mean age was 57.89±5.45 and ranging from 50-75. Majority were in the age group of 50-59 years 68.4%. Majority of them were males 66.8%. Around 52% were employed. Majority 94% were from Surat.

Prevalence of Opportunistic Infections among older PLHIV was found 63.7% (121 cases out of 190).

Out of 190 older PLHIV, 63.7 % had diagnosed Opportunistic Infections (OIs). The most frequent OI found among ≥ 50years old HIV positive patients was Tuberculosis (22.1%) followed by Upper respiratory tract infection (17.2%) and Candidiasis (13.2%). Other OIs like diarrhoea (9.8%), lower respiratory tract infections (5.4%), Pruritic Papular Eruptions (4.9%) and UTI (3.9%), Bacterial skin infection (3.4%), Herpes Zoster (1.5%), Pneumocystis carinii pneumonia (1%) and (17.6%) miscellaneous infections (Lower respiratory tract infections, Tinea, HIV encephalopathy, Herpes simplex, HIV-associated neuropathy, oral ulcer, wasting, Progressive Multifocal Leukoencephalopathy, Persistent Generalised Lymphadenopathy, pyoderma, CMV infection) were also reported by older PLHIV. **(Table: 1).**

Over all prevalence of opportunistic infections among older PLHIV was 63.7%. From these; 55.4% of PLHIV had only 1 opportunistic infection during study period, while the prevalence of 2,3, and 4 OIs per one patient during the study period were 23.1% , 17.4% and 4.1% respectively. **(Table: 2).**

Table 1: Distribution of opportunistic inections among older PLHIV. (N=204* Multiple response)

Types of Opportunistic Infections	Cases (%)
Tuberculosis	45 (22.1)
Upper respiratory tract infection	35 (17.2)
Candidiasis	27 (13.2)
Diarrhea	20 (9.8)
Lower respiratory tract infection	11 (5.4)
Pruritic Papular Eruptions	10 (4.9)
Urinary tract infection	8 (3.9)
Bacterial Skin Infections	7(3.4)
Herpes Zoster	3(1.5)
Pneumocystis carinii pneumonia	2(1)
Others	36(17.6)

Table: 2 Number of opportunistic infections diagnosed per patient among study participants

Variable	Cases (N=121) (63.7%)
1 Opportunistic infection	67 (55.4%)
2 Opportunistic infection	28 (23.1%)
3 Opportunistic infection	21 (17.4%)
4 Opportunistic infection	5 (4.1%)

Table: 3 Mode of transmission reported by older PLHIV

Transmission (self-reported)	Cases (N=190) (%)
Heterosexual	131 (68.9)
Unknown	31 (16.3)
Blood transfusion	18 (9.4)
Mae Sex with Male	4 (2.1)
Probable unsafe injection	3 (1.6)
Commercial sex work	2 (1.1)
Intravenous Drug Use	1 (0.5)

Most common mode of transmission reported by older PLHIV was Heterosexual (68.9%) followed by unknown cause (16.31%) and blood transfusion (9.47%) **(Table: 3).**

By applying binary logistic regression statistically significant predictors for OIs were WHO clinical stage III and IV in first visit, CD4 at Reg. <200, Weight <50kg in last visit.

As illustrated from the table, that odds of acquiring OIs among HIV positive individuals who had baseline WHO stage III was 8.28 times higher than those who had baseline WHO stage I.

Odds of acquiring OIs were 21.69 times higher among HIV positive individuals who had baseline WHO stage IV then those whose baseline WHO stage I.

A chance of getting OIs was 3.65 times higher among those whose baseline CD4 count <200 cells/cumm than those whose baseline CD4 count was >350 cells/cumm.

Odds of acquiring OIs were 2.97 times higher among those whose weight in last visit were <50kg then those whose weight >50 in last visit.

Thirty four percent of variance for OIs (dependent variable) is explained by Baseline WHO stage III and IV, Baseline CD4 count <200cells/cumm and Weight in last visit <50kg (independent variables) as Nagelkerke R square value is 0.341

χ^2 statistics for Hosmer and Lemeshow is 6.620 (p= 0.578). Multivariate analysis shows that there are four factors which are consistently associated with p value ≤0.05 for each variable. **(Table: 4)**

Table: 4 Predictors of opportunistic infections among older PLHIV. (N=190)

Variables	Sig.	Exp(B)	95% C.I. for EXP(B)	
			Upper	Lower
50 years to 59 years	0.479			
60 years to 69 years	.928	.961	.408	2.266
70 years to 79 years	.228	.315	.046	2.061
Female	.319	1.826	.559	5.962
Adherence 100	.561			
Adherence 80 to 99	.412	.680	.271	1.708
Adherence <80	.537	2.076	.204	21.159
Weight at first visit <50	.077	2.579	.903	7.363
Baseline WHO clinical stage I	.000			
Stage II	.139	1.902	.812	4.456
Stage III	.000	8.282	2.873	23.870
Stage IV	.001	21.696	3.830	122.904
WHO clinical stage I at current visit	**.998**			
Stage II	.981	.989	.408	2.398
Stage III	.895	1.200	.080	17.983
Stage IV	.890	1.222	.071	21.091
Job	.871			
Unemployed/HW	.948	.962	.296	3.123
Self employed	.606	.784	.311	1.975
Baseline CD4 >350 cells/cumm	.048			
Baseline CD4 <200 cells/cumm	.034	3.655	1.104	12.107
Baseline CD4 200 to 350 cells/cumm	.722	1.206	.429	3.388
CD4 at Current visit >350 cells/cumm	.773			
CD4 at Current visit <200	.473	1.624	.432	6.103
CD4 at Current visit 200 to 350	.570	1.505	.368	.156
Weight in last visit <50	.036	2.974	1.075	8.231

Hosmer and Lemeshow Statistics	χ^2 = 6.620	p = 0.578
Model χ^2 (degree of freedom= 19)	χ^2 = 54.497	p = 0.000
Cox and Snell R^2	0.249	
Nagelkerke R^2	0.341	

DISCUSSION

The current study assessed the prevalence and predictors of opportunistic infections among HIV Positive Patients. The study found that 55.4% of HIV patients taking ART had got at least one OI during the study period and overall OIs prevalence of 63.7% with repeated infection. When compared with other similar studies, the prevalence of OIs in the current study area is higher than a study conducted by Moges et al. in a resource limited setting with a prevalence of 42.8 %.[6] This difference is because difference in sample size of older PLHIV in both studies.

Present study found that most common self-reported risk factor for occurrence of HIV was heterosexual route of transmission (68.9%) followed by unknown 16.3%, blood transfusion 9.4% and MSM 2.1%. Study done in Nigeria by Akinyemi et al reported heterosexual route was most common for HIV transmission among elderly.[7] Unknown 16.3% reported by older PLHIV might be due to non-discloser or due to stigma.

Present study identified Tuberculosis (22.1%), Upper respiratory tract infections (17.2%), Oral candidiasis (13.2%), Diarrhoea (9.8 %) were common types of OIs found in elderly HIV positive individuals. Study done by Shahapur et al in South India found Tuberculosis (43.6%), Candidiasis (30.9%) and Diarrhoea (21.8%) as common types of opportunistic infections[8]. While similar findings to present study was observed in study done in Tripura by Bhaumik et al and Hari Krishna et al.[9,10]. This is because symptoms of these OIs can be easily identified by the patients than other OIs. Study done by Chakraborty et al in Eastern India reported Oral candidiasis as the most common type of OI followed by tuberculosis[11].

Current study also found predictors of OIs among older PLHIV. Baseline WHO clinical stage III and IV, Baseline CD4 <200 cells/cumm, weight <50kg in last visit were predictors of OIs among older PLHIV. A study done in Eastern Ethiopia by Mitiku et al also found baseline CD4 cell count ,200 cells/cumm, baseline World Health Organization (WHO) clinical stage III and IV were have strong association with acquisition of OIs which is similar to present study findings[6,12–14].

CONCLUSION

On the basis of the findings from this study, we concluded that among older PLHIV more than fifty years of age prevalence of opportunistic infections (OIs) was more than sixty percent with tuberculosis being the most common infection. Low baselines CD4 count; baseline WHO clinical stage and weight were predictors for OIs.

RECOMMENDATIONS

We recommend regular screening and follow-up of PLHIV above age 50 years having CD4 counts <200cells/cumm, III and IV baseline WHO stage and weight less than 50kg with specific focus on common opportunistic infections especially tuberculosis, URTI and candidiasis.

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