



## Research Article

# The Dynamic Spectrum of Otorhinolaryngological Manifestations in HIV Infected Patients - An Observational Study in A Tertiary Care Centre in India

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### Abstract

**Aim:** To study and estimate the prevalence of the various otorhinolaryngological manifestations in HIV patients receiving antiretroviral therapy (ART). **Material and Methods:** This study, conducted at the Department of Otorhinolaryngology (E.N.T) in J.J. Hospital, India, involved 100 HIV-infected patients aged 18 years and above, who were receiving antiretroviral therapy. Written informed consent was obtained from all participants after explaining the study objectives. Demographic and clinical data were collected, analysed using appropriate tools following clinical history-taking and examination. **Results:** In this study, the male to female ratio was 3:1 with the commonest age group being 48- 57 years. Oral manifestations were the most common with oral candidiasis seen in 23 % of the patients followed by herpes labialis (9%). Otologic findings were seen in 29 % of the patients, chronic otitis media (14%) being the commonest. Nasal pathology was found in 13% with commonest being rhinosinusitis (7%). A statistically significant but weak inverse relationship was seen between CD4 counts and a history of COVID-19( $p = 0.006$ ). **Conclusion:** Antiretroviral therapy significantly influenced the prevalence and reduced the severity of otorhinolaryngological manifestations in HIV patients, emphasizing the importance of early detection and management. Comprehensive healthcare models integrating virologic suppression and otolaryngological health management are crucial for enhancing outcomes and well-being in HIV patients.

**Keywords:** Otorhinolaryngology; HIV; CD4 Counts; Antiretroviral Therapy;

### Introduction

Human Immunodeficiency Virus (HIV) is a retrovirus that targets and impairs helper T-cells, leading to compromised cell-mediated and humoral immunity [1]. Transmission primarily occurs through direct exposure to infected blood and specific bodily fluids, as well as via the use of unsterile medical or dental equipment, unprotected sexual intercourse, and the sharing of unsterile needles or personal hygiene items like razors and toothbrushes.

Despite being identified as a pathogen three decades ago, HIV remains a significant global pandemic, with escalating infection rates worldwide, posing a substantial public health burden [2].

Antiretroviral therapy (ART) is the mainstay of HIV management, aiming to suppress viral replication within the body [3]. Over the years, advancements in treatment modalities, coupled with enhanced education and awareness programs, have fostered greater patient adherence to therapy [4]. Consequently, there has been a notable expansion in the accessibility and utilization of antiretroviral medications, contributing significantly to the improved clinical outcomes and overall prognosis for individuals living with HIV [5].

Otorhinolaryngological diseases and HIV have a well-established link. Several studies have shown that 80% of HIV-infected patients present with ear, nose and throat symptoms. Candidiasis, rhinosinusitis, allergic rhinitis, lymph node enlargement in the neck, adenoid enlargement, and chronic otitis media are commonly reported in HIV infected patients [6].

Certain otorhinolaryngological conditions are recognized as opportunistic infections in the context of HIV and are key criteria in the World Health Organization's clinical staging of the disease [7]. Immunodeficiency due to HIV can be a possible risk factor for diseases such as COVID-19 [8].

The otorhinolaryngological manifestations in association with HIV infection are non-specific and fairly common in clinical practice, therefore, immunodeficiency may not be suspected [9]. The severity of otorhinolaryngological manifestations tends to escalate with advanced stages of HIV disease [10]. In this study, only patients receiving ART were included to see whether increased accessibility and availability of ART have influenced the clinical landscape of otorhinolaryngological manifestations associated with HIV infection.

### Aim

Our study focuses on assessing the various otorhinolaryngological manifestations in HIV patients receiving treatment at our ART center and the impact of ART on the patterns of presentation.

### Material and Methods

It was an observational, cross-sectional study carried out in the Department of Otorhinolaryngology, Grant Medical college and Sir JJ Group of Hospitals, Mumbai, India from December 2022 to February 2024. The Institutional Ethics Committee approved the study protocol (meeting date; 23/11/2022, decision number; IEC/PG/977/NOV/2022) with approval of National AIDS Control Organization (NACO) and Mumbai District AIDS Control Society (MDACS) (approval number – MDACS/805/APD). A written informed consent was obtained from all the patients after explaining the objectives of the study. Precautions were taken throughout the study to safeguard the rights and confidentiality of all the participants.

### Inclusion Criteria

Patients of either sex, above 18 years of age who were HIV infected and were on antiretroviral therapy presenting with ear, nose, throat symptoms to the ART Centre were referred to Department of Otorhinolaryngology for further evaluation and were included in the study.

### Exclusion Criteria

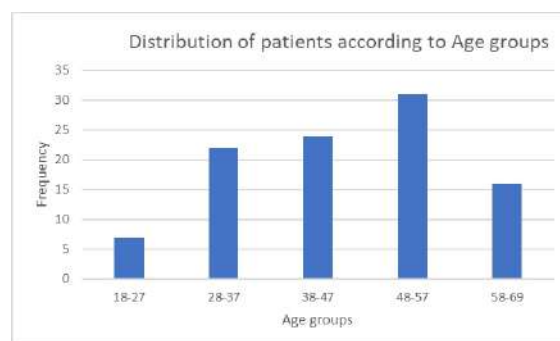
Patients not willing to give consent were excluded from this study.

### Methodology

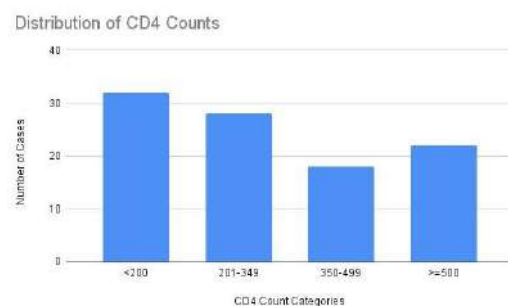
100 patients meeting the inclusion criteria were enrolled in the study after taking written informed consent. Thorough history taking and clinical examination of patients was done and the collected data was analysed. Continuous variables were presented by median (interquartile range). Categorical variables were tested between groups of patients using Chi-2 or Fisher's exact test.

### Results

In our study, we included 100 patients diagnosed with HIV, on antiretroviral therapy. Among them 76 were male (76%) and 24 females (24%). These patients were further distributed based on age groups and it was observed that maximum patients were in the age group of 48-57yrs (31%). Out of the 100 patients, it was found that 32 patients (32%) had CD4 counts less than 200 cells/mm<sup>3</sup>, 28 patients (28%) had counts between range of 200-349 cells/mm<sup>3</sup>, 18 patients (18%) had counts between range of 350-499 cells/mm<sup>3</sup> and 22 patients (22%) had counts of more than 500 cells/mm<sup>3</sup>. 25% of patients reported a positive family history of HIV infection, including 22% with an HIV-positive spouse and 3% with one or both parents being HIV-positive.



**Figure 1:** Distribution of patients according to age group.



**Figure 2:** Distribution of CD4 counts among patients

The most common presentation was of oropharyngeal manifestations which were seen in 43 patients (43%), out of which oral candidiasis was the most common which was seen in 23 patients (44.23%), followed by herpes labialis which was seen in 9 patients (17.3 %), 6 patients (11.5%) presented with leukoplakia and 5 patients (9.6%) presented with tonsillitis.

Of the nose manifestations which were seen in total of 15 patients (15%), the most common was rhinosinusitis, seen in 7 patients (46.66%), followed by allergic rhinitis which was seen in 5 patients (33.33%), 2 patients (13.3%) presented with adenoid hypertrophy and 1 patient (6.67%) presented with septal abscess.

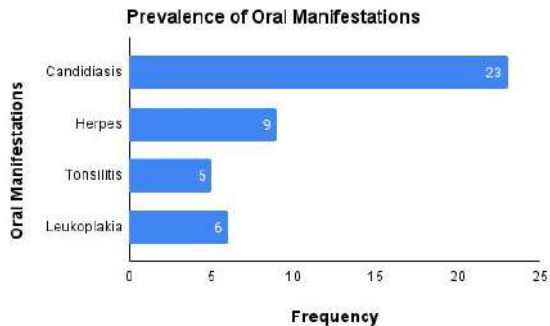


**Figure 3:** Oral candidiasis seen in a patient of our study.

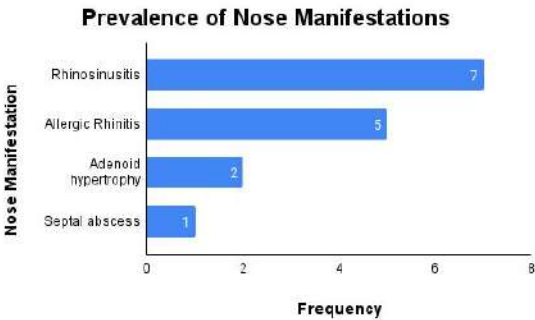


**Figure 4:** Herpes labialis seen in a patient of our study.

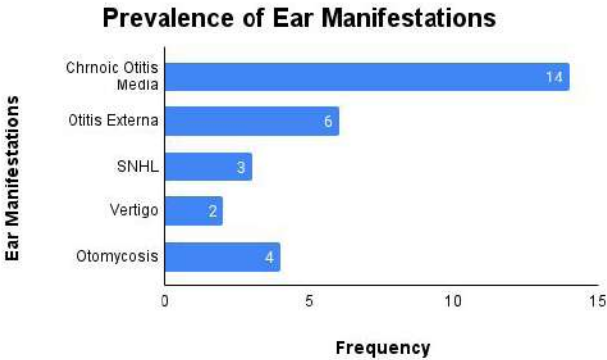
Ear manifestations were seen in total of 29 patients (29%), of which the most common was chronic otitis media, seen in 14 patients (48.2%), followed by otitis externa which was seen in 6 patients (20.68%), 4 patients (13.79%) presented with otomycosis and 3 patients (10.3%) presented with SNHL and 2 patients (6.89%) presented with vertigo.



**Figure 5:** Prevalence of oral manifestations in this study



**Figure 6:** Prevalence of nose manifestations in this study

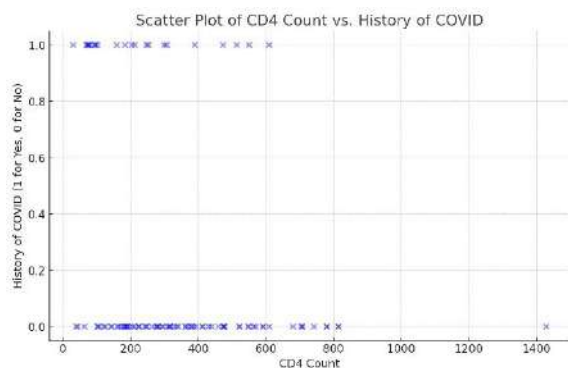


**Figure 7:** Prevalence of ear manifestations in this study

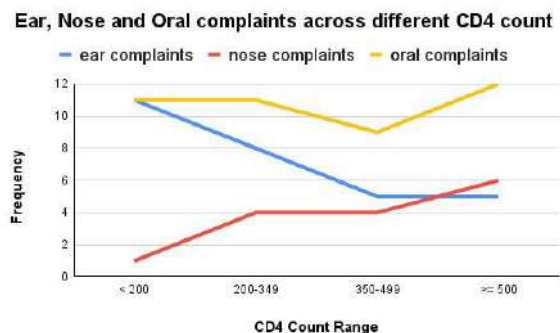
Out of the remaining patients, 11 patients presented with cervical lymphadenopathy out of which 9 were tubercular and 2 were nonspecific. 2 patients presented with hoarseness of voice.

In this study, it was found that as the CD4 count increases, there is a general trend of decreasing complaints for the ear, with the lowest complaints observed in the CD4 count  $\geq 500$  range. However, the nose complaints increase in values in the CD4 count  $\geq 500$  range.

Out of the total 100 HIV infected patients, 15 patients had developed Covid 19 infection in the past. The Pearson correlation coefficient between CD4 counts and history of COVID-19 in patients suffering from HIV is approximately -0.273, with a p-value of 0.006. This indicates a weak inverse relationship between CD4 counts and a history of COVID-19, which is statistically significant.



**Figure 8:** Correlation between CD4 counts and H/O COVID 19



**Figure 9:** ENT complaints across CD4 count ranges

## Discussion

According to the India HIV Estimation 2019 report by the National AIDS Control Organisation (NACO), the estimated adult (ages 15-49) HIV prevalence in 2019 was 0.22% (with a range of 0.17–0.29%) [11]. In our study the peak incidence of HIV was found in the 48-57 age group. The patient group exhibited a male to female ratio of 3:1, which was not statistically significant. This finding aligns with the results observed in the research conducted by Deb et al. [12].

The incidence of otorhinolaryngological manifestations in HIV patients is approximately 80%. This observation is supported by the study conducted by Kirti et al., which emphasized that oral conditions, notably oral candidiasis, are the most frequently encountered manifestations [1, 13]. In alignment with these findings, our study also found oral candidiasis as the most common manifestation, affecting 23% of patients, where the mean CD4 count was recorded at 218.04 cells/mm<sup>3</sup>, indicative of WHO Stage 3.

However, there has been a considerable decrease in the prevalence of cervical lymphadenopathy in our study, noted at 11% as compared to the 59% prevalence rate found by Prasad et al in their study [3]. This decline can be largely attributed to the global implementation of antiretroviral therapy, underlining its efficacy

in mitigating the severity and frequency of otolaryngological symptoms among HIV-positive patients.

Chronic otitis media was the most common otologic condition seen in our study, affecting 14% of the patients, followed by otitis externa and otomycosis, with prevalence rates of 6% and 4% respectively. These conditions are likely the result of opportunistic infections, which are a frequent complication in individuals living with HIV. However, the prevalence of hearing loss and vertigo were relatively low, about 3% and 2% respectively, representing a marked decrease from the prevalence reported in the study by Chandrashekhar et al., where it was 32% and 29% respectively [14]. This variation further highlights the potential impact of improved medical management and the effectiveness of antiretroviral therapy.

In this study, a statistically significant but relatively weak inverse relationship ( $p=0.006$ ) between CD4 cell counts and the incidence of COVID-19 infections among HIV-infected patients was found. This indicates that individuals with lower CD4 counts, reflecting a compromised immune system due to HIV progression, are at increased risk for COVID-19, which targets weakened immune system. However, the correlation's weakness indicates that CD4 count alone does not fully predict the risk of COVID-19 infection and indicated the presence of other influencing factors as well. The influence of antiretroviral therapy on COVID-19 susceptibility and progression also warrants consideration, which may help maintain or partially restore immune function, potentially mitigating the risk posed by COVID-19 despite low CD4 counts [15].

In this study, no instances of parotid cysts, head and neck tumours, or facial palsy were recorded. This outcome may be linked to the adherence to antiretroviral therapy among all participants there by preventing severe complications.

## Study limitations

The study relied exclusively on data sourced from the ART centre within our hospital, with referrals to our outpatient department initiated by the centre's medical officer for further evaluation. Consequently, individuals not diagnosed with HIV or those with undiagnosed HIV who presented to the Otorhinolaryngology department with regular complaints may have been inadvertently omitted from the dataset.

Subclinical manifestations might have been overlooked, as the data collection process was primarily based on clinical examination findings, potentially underestimating the true prevalence and spectrum of otorhinolaryngological manifestations in HIV-positive individuals.

The sample size utilized in the study was relatively small which may have limited the representation of the entire spectrum of disease manifestations within the HIV-positive population.

The data was derived from a single tertiary care centre, thereby restricting the generalizability of findings to the broader population.



## Conclusion

This study delineates the prevalent otorhinolaryngological manifestations in HIV positive individuals, reflecting the impact of ART on the disease presentation. It signifies its efficacy in averting the severity of potential complications and accentuates the critical need for vigilant health surveillance. Given the shift towards more subtle disease presentations, there is a need to increase awareness of the ENT manifestations in HIV patients to avoid missing out on subclinical conditions and preventing complications. The comprehensive approach of timely testing, accurate diagnosis, and integrated management advocates for a holistic healthcare model that prioritizes both virologic suppression and the meticulous management of otolaryngological health, promoting improved outcomes and well-being for those living with HIV.

## Acknowledgments

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## Declarations

### Author Contributions

Conceptualization- Dr.S.C and Dr.K.S; Methodology- Dr.S.C and Dr.K.S; Software- Dr. K.S and Dr. A.P ; Validation- Dr. V.K and Dr. A.P; Formal Analysis- Dr. K.S and Dr. A.P; Investigation- Dr. S.C and Dr.V.K; Resources- Dr.S.C and Dr.K.S; Data Curation- Dr.S.C and Dr.K.S; Writing – Original Draft Preparation- Dr.S.C and Dr.K.S; Writing – Review & Editing- Dr.P.S; Visualization- Dr.P.S; Supervision- Dr.P.S.

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**Conflicts of Interest:** None

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.

**Data Availability Statement:** Data supporting the study results can be provided followed by request sent to the corresponding author's e-mail.

**Ethics Approval:** All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Ethics Committee of Grant Medical College and Sir JJ Group of Hospitals, National AIDS Control Organization India (NACO) and Mumbai District AIDS Control Society (MDACS).

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