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ENT manifestations and surgical interventions in patients with HIV

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ABSTRACT

Background. Human Immunodeficiency Virus (HIV) infection represents a significant global health challenge, being one of the most interesting areas of current medicine regarding immunosuppression.

Objective. The purpose of this study is to clinically evaluate the ear, nose, and throat (ENT) manifestations in HIV-positive patients and to determine the outcomes after surgical treatment of these manifestations.

Methods. The clinical study sample included 223 HIV-positive patients from several hospitals in Romania, collected between 2018 and 2022, who presented with ENT complications and were treated for the remission of these manifestations.

Results. The most common ENT complications diagnosed in HIV patients include persistent oral candidiasis, laterocervical adenopathies, acute tonsillitis, acute and chronic rhinosinusitis, otomycosis, and acute suppurative otitis media.

Conclusion. HIV-positive patients require regular follow-up by an otorhinolaryngologist. Surgical interventions for immunosuppressed patients necessitate a multidisciplinary approach.

Keywords: ENT manifestations, HIV patients, oral candidiasis, laterocervical adenopathies, rhinosinusitis

INTRODUCTION

HIV infection remains a major public health crisis worldwide. Although clinical trials have yielded promising results for HIV prevention and treatment, a vaccine has not yet been developed, which continues to present a significant global health challenge.

The increased prevalence of HIV/AIDS has resulted in a growing number of HIV-infected patients presenting to ENT clinics. Approximately 80% of people with HIV/AIDS have various otolaryngological (ENT) conditions [1,2].

40 years after its discovery, HIV remains a global threat, particularly affecting people in Africa, Southeast Asia, and Latin America [3]. Predisposing factors for the occurrence of ENT manifestations in HIV-positive patients include a CD4+ cell count of less than 200/μL, higher plasma HIV-RNA levels of more than 3000 copies/ml, poor oral hygiene, and smoking [4-9].

The human immunodeficiency virus (HIV) is a retrovirus that infects and destroys the function of the immune system cells. It infects and alters T helper cells, weakens cell-mediated and humoral immunity, and increases susceptibility to encapsulated

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organisms such as Streptococcus pneumoniae and other bacteria [10,11]. This immunity imbalance predisposes HIV-infected individuals to develop ear, nose, and throat (ENT) diseases [12-14]. Commonly reported ENT manifestations in HIV-positive patients include oral candidiasis, enlarged lymph nodes, rhinosinusitis, allergic rhinitis, acute tonsillitis, and chronic suppurative otitis media [15-17].

In 2024, managing the spread of HIV remains increasingly difficult without effective prevention strategies. Contributing factors include the growing number of drug users, the expanding LGBT community and insufficient sex education. In 2018, more than 50% of all HIV infections were among homosexuals and members of the LGBT community [19].

The LGBTQ+ community is identified as a high-risk group, making prevention essential for this social category. Nearly 50% of HIV infections occur within homosexual groups, underscoring the primary importance of prevention in this population [20]. Notably, women and transgender people represent a social category facing unique challenges, as they reach lower concentrations of FCT-TDF in the blood due to estrogen levels, complicating HIV prevention. This warrants further studies to identify the possible repercussions [21].

Based on these considerations, we conducted this study to identify ENT manifestations in immunosuppressed patients and followed their evolution after ENT treatment simultaneous with antiretroviral treatment. The ENT surgeons needed to pay special attention to the progress of HIV-positive patients presenting with associated comorbidities and a compromised immune system.

MATERIAL AND METHOD

This retrospective, longitudinal, observational and multicentric study, was conducted from January 2018 until December 2022. The study was carried out in various Romanian Clinics: HIV/AIDS Day Clinic of the Constanta Clinical Infectious Diseases Hospital, Psycho-social assistance department for HIV/AIDS patients of the Baylor Black Sea Foundation, ENT Clinic of Constanța County Clinical Emergency Hospital, Alexandru Gafencu Military Emergency Hospital of Constanta, ENT Clinic of Coltea Clinical Hospital, Bucharest and ENT Clinic of CF Cluj-Napoca Clinical Hospital.

The study included 223 patients who presented ENT complications and who were treated for these manifestations. Depending on the site of ENT manifestations, HIV patients included in the study were grouped in otological, neck, oral cavity, rhinosinusal categories. The study sample required a biological evaluation by CD4 T lymphocytes count at the time of presenting to ENT clinics. To obtain data about the quality of life before and after ENT treatment, we used questionnaires such as the Visual Analogue Scale (VAS) and the Depression Anxiety Stress Scale (DASS-21) to determine whether there was an improvement in health status.

RESULTS

Age characteristics

The ages of HIV-positive patients included in the study ranged from 12 to 72 years, with an average age of 42.96 years and a standard deviation of 11.26 years. The average age values, standard deviations, and minimum and maximum values corresponding to each category of ENT manifestations are presented in the table below. (Table 1)

Sex characteristics

In this study, it was found that male gender is predominant in diseases of the throat (63.41%) and oral cavity (61.18%). (Table 2) The study also noted that otological (50.98%) and rhinosinus (52.17%) diseases are more prevalent in the female sex. Conditions such as otitis, otomycosis, sensorineural hypoacusis, benign paroxysmal positional vertigo are more common in women. (Table 2)

The sites of ENT diseases and disorders in HIV patients are as follows:

1. The ear (otological site) with various manifestations in 51 patients (22.87%), including acute suppurative otitis media, otitis externa, chronic suppurative otitis media, or otomycosis, while serous otitis had a lower incidence (Table 3).
2. The nose (rhinosinusal site) was involved in 46 patients (20.63%) (Table 3), with conditions such as nasal septum deviation, acute and chronic rhinitis, acute and chronic sinusitis, nasal polyps and epistaxis.
3. The throat, with conditions such as lateral cervical adenopathies, toxoplasmosis, mononucleosis, adenitis, acute laryngitis, reflux

TABLE 1. Distribution of HIV-positive patients with ENT manifestations by age group

Localization of ENT manifestations	No	Average	DS	Min	Max	Percentiles		
						P25	Mediana	P75
Otological	51	41.84	11.13	12.00	63.00	33.00	41.00	51.00
Neck	41	40.71	11.20	15.00	63.00	30.00	42.00	49.00
Oral cavity	85	43.24	10.97	17.00	70.00	34.00	42.00	51.00
Rhinosinusal	46	45.67	11.76	24.00	72.00	37.50	43.50	56.00

TABLE 2. Distribution of the HIV positive patients with ENT manifestations by gender according to the localization of the ENT manifestations

Localization of the ENT manifestations							
			Otological	Neck	Oral cavity	Rhinosinusal	Total
Gender	Male	Count	25[a]	26[a]	52[a]	22[a]	125
		% within Localization	49.02%	63.41%	61.18%	47.83%	56.05%
	Female	Count	26[a]	15[a]	33[a]	24[a]	98
		% within Localization	50.98%	36.59%	38.82%	52.17%	43.95%
Total		Count	51	41	85	46	223
		% within Localization	100.0%	100.0%	100.0%	100.0%	100.0%

laryngitis, vocal cord paralysis, vocal cord polyps, laryngeal neoplasms, and Non-Hodgkin's lymphomas, diagnosed in 41 patients (18.39%) (Table 3).

Advanced antiretroviral treatment represents a positive dynamic. Because of this, ENT treatment responds favorably if the HIV-positive patient is stable regarding antiretroviral treatment. In our study, it is found that the male gender is predominant in diseases of the throat and oral cavity. Candidiasis, herpes simplex, angular cheilitis, hairy leukoplakia, Kaposi's sarcoma, non-Hodgkin's lymphoma, laryngitis, mononucleosis, toxoplasmosis, adenitis, and laryngeal infections were found to be more common in men.

In this study, it is demonstrated that the CD4 lymphocyte count at the time of onset of ENT disease is higher compared to the time of HIV detection. The CD4 lymphocyte count limits the therapeutic approach because, to benefit from surgical intervention, the patient must have a CD4 count greater than 200. In this paper, a higher proportion of patients with CD4 counts above 200 is observed for those with rhinosinusal conditions (54.35%) (Table 4). Patients presenting with oral cavity pathologies have lower CD4 lymphocyte counts (CD4 <200, in 28.24% of cases), indicating that they are severely immunosuppressed and in critical condition. (Table 4)

TABLE 3. Distribution of ENT manifestations in HIV patients

ENT events headquarter			
		Frequency	Percent
Valid	Otological	51	22.87
	Neck	41	18.39
	Oral cavity	85	38.12
	Rhinosinusal	46	20.63
	Total	223	100.00

Of the 223 patients with ENT manifestations, 21.08% required surgery (Table 5). Most surgeries were performed at the rhinosinusal level (32.61%) through FESS operations, addressing conditions such as chronic sinusitis, pansinusitis, nasal polyposis, nasal septum deviations, or rhinosinus tumor formations (Table 5). Other common ENT surgeries included cervical ganglion biopsies and suspended microlaryngoscopy biopsies of tumor formations located in the larynx (31.71%). (Table 5)

There is a dependent relationship between the surgical interventions and the localization of the ENT manifestations: $\chi 2calc = 10.830$, $df = 3$, $p = 0.013 < \alpha = 0.05$ ($\chi 2$ test of association between two categorical variables).

TABLE 4. Distribution of CD4 values at the onset of ENT manifestations according to the anatomical site

Localization of ENT manifestations							
			Otological	Neck	Oral cavity	Rhinosinusal	Total
CD4 at the appearance of ENT manifestations	<200	Count	6[a]	8[a, b]	24[b]	5[a]	43
		% within Localization	11.76%	19.51%	28.24%	10.87%	19.28%
	200-499	Count	24[a]	19[a]	31[a]	16[a]	90
		% within Localization	47.06%	46.34%	36.47%	34.78%	40.36%
	>500	Count	21[a, b]	14[a, b]	30[b]	25[a]	90
		% within Localization	41.18%	34.15%	35.29%	54.35%	40.36%
Total		Count	51	41	85	46	223
		% within Localization	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 5. Distribution of HIV positive patients by ENT manifestations after surgery

ENT manifestation headquarters							
			Otological	Neck	Oral cavity	Rhinosinusal	Total
Surgery	Yes	Count	6[a]	13b	13a	15b	47
		% within headquarters	11.76%	31.71%	15.29%	32.61%	21.08%
	No	Count	45[a]	28b	72a	31b	176
		% within headquarters	88.24%	68.29%	84.71%	67.39%	78.92%
Total		Count	51	41	85	46	223
		% within headquarters	100.0%	100.0%	100.0%	100.0%	100.0%

In the study, it was observed that ear conditions responded well to treatment, with 56.86% of cases of otological diseases such as purulent otitis media, otomycosis, sensorineural hearing loss, vestibular syndromes, and serous or external otitis being cured (Table 6). Diseases of the nose and paranasal sinuses were cured in 60.87% of cases, including pathologies such as rhinosinusitis, epistaxis, abscesses, nasal septum deviations, and rhinitis. (Table 6)

Patients with diseases in the oral cavity and throat (e.g., persistent oral candidiasis, stomatitis, herpes, acute tonsillitis, later cervical adenopathies, Kaposi's sarcoma, lymphomas, laryngitis, laryngeal neoplasms) exhibited unfavorable developments in 65-68% of cases. (Table 6)

There is a dependent relationship between the evolution of ENT conditions and the localization of ENT manifestations: $\chi 2calc = 14.580$, $df = 3$, $p = 0.002 < \alpha = 0.05$ ($\chi 2$ test of association between two categorical variables).

The evolution of ENT

The Visual Analog Scale (VAS) score at the time of detection of ENT pathology is represented by a questionnaire that assesses the intensity of pain at the site at the time of admission. This score correlates with the type of treatment, patient evolution, health status at discharge, and quality of life after the healing of ENT complications.

This study included patients with pain in the oral cavity (85 patients), ear pain (51 patients), rhinosinus pain (46 patients), and neck pain. The VAS score ranged from a minimum of 0 (no pain) to a maximum of 9. (Table 7) The Median Test indicated statistically significant differences between the median VAS scores at the moment of detecting ENT pathology for at least two of the pain localization categories ($\chi 2 = 8.213$, $df = 3$, $p = 0.042 < \alpha = 0.05$). (Table 7) The Kruskal-Wallis test also showed statistically significant differences in the distribution of VAS scores at the time of detecting ENT pathology among the four localization categories ($H = 9.456$, $df = 3$, $p = 0.024 < \alpha = 0.05$). The average ranks of the scores were 118.76 for the otological group, 135.39 for the neck group, 101.48 for the oral cavity group, and 103.09 for the rhinosinus group. (Table 7)

The VAS score after ENT treatment is assessed using a questionnaire that measures the intensity of pain at the otorhinolaryngology office at the time of discharge. The results indicate a favorable evolution of ENT complications, with pain decreasing in intensity or completely remitting. The study observed that conditions such as persistent oral candidiasis, angular cheilitis, hypertrophy of the palatine tonsils, periodontal diseases, and cancers of the oral cavity have increased VAS scores, indicating an unfavorable evolution of ENT complications.

At the cervical level conditions remain highly sensitive to pain, with the maximum VAS score

TABLE 6. Modalities of ENT Diseases evolution, according to the localization categories

Localization of ENT manifestations							
			Otological	Neck	Oral cavity	Rhinosinusal	Total
ENT evolution	Favorable	Count	29[a]	13[b]	29[b]	28[a]	99
		% within Localization	56.86%	31.71%	34.12%	60.87%	44.39%
	Unfavorable	Count	22[a]	28[b]	56[b]	18[a]	124
		% within Localization	43.14%	68.29%	65.88%	39.13%	55.61%
Total		Count	51	41	85	46	223
		% within Localization	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 7. VAS score at the time of detection of ENT pathology

Manifestation headquarters	N	Mean	SD	Min	Max	Percentiles		
						P25	Median	P75
Otological	51	3.18	3.01	.00	9.00	.00	3.00	6.00
Neck	41	3.71	2.87	.00	9.00	1.00	3.00	6.00
Oral cavity	85	2.29	2.58	.00	9.00	.00	1.00	4.00
Rhinosinusal	46	2.24	2.33	.00	8.00	.00	2.00	4.00

reaching 7 points (Table 8). For ear and nose conditions, a maximum VAS score of 5 points is reported (Table 8). The study found that the pain threshold for ear and nose infections decreased and that drug treatment improved or cured the ENT pathology.

The Kruskal-Wallis test shows statistically significant differences in the distribution of VAS scores post-ENT treatment among the four localization categories ($H = 9.337$, $df = 3$, $p = 0.025 < \alpha = 0.05$). The average ranks of the scores were 114.83 for the otological group, 134.79 for the neck group, 103.25 for the oral cavity group, and 104.71 for the rhinosinusal group (Table 8).

The Depression Anxiety Stress Scales (DASS-21) show that most patients have normal or slightly elevated scores due to stress caused by the disease, with 13.73-19.57% of patients having severe scores (Table 9). Among these, patients with neck pathologies have a severe DASS-21 score at a rate of 12.20% (Table 9).

DISCUSSION

In this study, we observed that 37.16% of patients presented with ENT manifestations, which is comparable to the findings of P.S. Shija's 2020 study, where the prevalence among 200 HIV-positive participants was 34% [23]. These manifestations predominantly occurred in immunocompromised patients with an average age of 40 years, most of whom had a favorable outcome due to their relatively young age, consistent with the findings of Swai H. et al. [22-23].A 2006 study in India involving 968 HIV-positive patients reported a prevalence of 79% for ENT manifestations. At that time, not all patients

TABLE 8. VAS score after ENT treatment

ENT manifestation headquarters	N	Mean	SD	Min	Max	Percentiles		
						P25	Median	P75
Otological	51	1.18	1.67	.00	5.00	.00	.00	2.00
Neck	41	2.05	2.42	.00	7.00	.00	1.00	4.50
Oral cavity	85	.94	1.74	.00	8.00	.00	.00	1.00
Rhinosinusal	46	.72	1.17	.00	5.00	.00	.00	1.00

TABLE 9. The Depression Anxiety Stress Scales (DASS-21)

			Localization of ENT manifestations				
			Otological	Neck	Oral cavity	Rhinosinusal	Total
DASS-21	Normal	Count	16[a]	10[a]	27[a]	13[a]	66
		% within Localization	31.37%	24.39%	31.76%	28.26%	29.60%
	Mild	Count	16[a]	11[a]	18[a]	11[a]	56
		% within Localization	31.37%	26.83%	21.18%	23.91%	25.11%
	Moderated	Count	7[a]	8[a]	18[a]	9[a]	42
		% within Localization	13.73%	19.51%	21.18%	19.57%	18.83%
	Severe	Count	7[a]	7[a]	15[a]	9[a]	38
		% within Localization	13.73%	17.07%	17.65%	19.57%	17.04%
	Critical	Count	5[a]	5[a]	7[a]	4[a]	21
		% within Localization	9.80%	12.20%	8.24%	8.70%	9.42%
Total		Count	51	41	85	46	223
		% within Localization	100.0%	100.0%	100.0%	100.0%	100.0%

were on HAART, resulting in lower CD4 lymphocyte counts [23]. HAART therapy and frequent monitoring of HIV patients in Infectious Disease Hospitals have shown that the disease can now be therapeutically controlled. The therapeutic approach for immunosuppressed ENT patients must balance specific organ condition treatments (invasive or non-invasive) with concomitant therapies, such as antiretroviral and oncological treatments.

The most common ENT complications in HIV-infected patients include persistent oral candidiasis, laterocervical adenopathies, acute tonsillitis, acute and chronic rhinosinusitis, ear otomycosis, acute suppurative otitis media, and hairy leukoplakia of the tongue. The distribution of ENT manifestations in immunosuppressed HIV patients showed that the majority had persistent oropharyngeal candidiasis (56.47%). These results are consistent with retrospective studies indicating that the most common site for ENT manifestations is the oral cavity. According to Kirti YK, oropharyngeal manifestations were the most common, similar to findings from previous studies conducted in India and Iran [2,27,28].

Bao S and Shao S [24] show in their study that the most common conditions were chronic tonsillitis (19.3%), chronic rhinosinusitis (14.0%), and vocal polyps (8.8%). In a prospective study by Tshifularo M et al. [25], adenoid hypertrophy (AH) (41.6%) was the most common ENT condition in HIV/AIDS patients in South Africa, with cervical lymphadenopathy being the second most common (39%). In India, the most common ENT manifestations in HIV/AIDS patients were oral candidiasis (20%) and cervical lymphadenopathy (20%) [26].

Certain differences can be observed between studies and pathologies, possibly due to geographic characteristics, lifestyle, or differences in observational and anamnestic data [24]. Depending on the site of ENT manifestations, HIV-infected patients were included in the study as follows: 85 patients with pathologies of the oral cavity (the most common), 41 patients with pathologies of the throat, 51 patients with pathologies of the ear (the second most common), and 46 patients with pathologies at the rhinosinus level.

In Shiping Bao's study, rhinonasal manifestations were the most common, followed by oropharyngeal and laryngeal disorders [24]. Bao notes that the anatomical localization of ENT manifestations varies across different studies from various countries. According to Kirti YK [26], oropharyngeal manifestations were the most common, similar to previous studies in India [26, 27] and Iran [28]. Additionally, it has been demonstrated that ear manifestations are more frequent in South Africa than in studies from other countries [25].

In our study, it was found that the male gender is predominant in diseases of the throat and oral cavity. Conditions such as candidiasis, herpes simplex, angular cheilitis, hairy leukoplakia, Kaposi's sarcoma, Non-Hodgkin's lymphoma, laryngitis, mononucleosis, toxoplasmosis, adenitis, and laryngeal infections are more common in men. There is a similarity between the results of retrospective studies and our current study regarding the gender distribution of ENT manifestations.

In this study it was observed that otological and rhinosinusal conditions are more widespread in the female sex. Conditions such as otitis, otomycosis, sensorineural hearing loss, benign paroxysmal positional vertigo, as well as sinusitis, epistaxis, and septal deviations, are more common in females.

HIV transmission mode, living conditions, behavior, smoking, and alcohol consumption are more prevalent among men. These factors, along with acquired immunosuppression, contribute to the higher incidence of ENT complications in men. Retrospective studies have shown that the frequency of ENT manifestations was higher in men (35.7%) compared to women (33.3%) [22]. Similarly, in Iran, ENT manifestations were also found to be higher in males compared to females [29].

Gay men have been the fastest growing risk group in the world's HIV epidemic in recent years [30,31]. These conclusions are supported by the findings of Deb et al. [32] and Prasad et al. [33].

The CD4 lymphocyte count at the onset of ENT manifestations was between 200-499 in 40.36% of patients, and greater than 500 in approximately 40.36% of patients. Patients with CD4 lymphocyte counts greater than 200 generally have a better prognosis and response to treatment. Studies have shown that most ENT diseases occur when the CD4 lymphocyte count falls below 200. Swai from Muhimbili, Tanzania, and Shija [22,23] reached the same conclusions. For HIV clinical staging, ENT manifestations with opportunistic infections were also included [34]. Similar findings regarding the correlation between CD4 lymphocyte count and ENT manifestations in HIV-positive patients were presented by Shiping Bao and Y.K. Kirti [24,26].

Surgery in HIV-positive patients was often postponed when the CD4 lymphocyte count was less than 200 and the viral load was high. The intervention was delayed until the patient stabilized, the CD4 lymphocyte count increased, and the viral load decreased. HAART therapy was administered to provide immune stability [24].

In our study, the most frequent surgical interventions for HIV-positive patients were biopsies of cervical adenopathies, endoscopic maxillary antrostomies for chronic sinusitis, and tonsillectomies due to recurrent purulent tonsillitis. Since the introduc-

tion of HAART as a treatment for HIV infection, an improvement in the quality of life has been observed in these patients [37]. However, ENT surgical outcomes in HIV/AIDS patients, particularly in the HAART era, have been poorly studied [24].

In retrospective studies, the frequency of surgeries for ENT conditions varied. The most common procedures were tonsillectomy (19.2%) [24], endoscopic sinus surgery (FESS), radiofrequency ablation of the nasal turbinates (14.0%), and resection of vocal cord polyps (8.8%) [24]. In another study involving 229 patients, Kligerman MP et al. [38] reported tonsillectomy (23.6%) as the most common ENT surgery. This finding was corroborated by studies from the United States, where tonsillectomy is the second most common ENT surgery [38].

Both in our study and in retrospective studies, the safety of ENT surgical interventions in HIV-positive patients has been observed, showing a favorable evolution with few complications, leading to the healing or improvement of conditions or the stabilization of a definite diagnosis [24]. The low rate of complications in HIV-positive patients is correlated with adequate HIV control and preoperative management.

In a retrospective cohort study of 803 HIV-infected patients requiring surgery in China by Feng TN et al. [39], it was estimated that 38.9% developed sepsis, and 17 patients (2.11%) died within 30 days [39]. The increasing use of minimally invasive surgical techniques, the growing experience of ENT surgeons, and the increasingly frequent or mandatory use of HAART have shown a much lower rate of postoperative complications [24]. HAART therapy is the most beneficial therapeutic approach for HIV patients, improving life expectancy and reducing the number of complications. Campanini et al. concluded in their studies that HAART led to a decrease in the prevalence of all ENT manifestations, including infections and tumors, and resulted in an increase in CD4 counts [41].

In our study, the efficiency and favorable outcomes were demonstrated by ENT follow-up evaluations and by calculating the VAS pain score at discharge after medical or surgical treatment. The DASS-21 score was used to assess the patient's emotional state at discharge. Most patients experienced depression due to the stress caused by the disease. A significant portion of patients were depressed, anxious, and fearful, unable to understand the purpose of medical or surgical treatment, and the reason for ENT check-ups. These patients need understanding and periodic monitoring to ensure a good outcome.

Variations in the prevalence of depression, anxiety, and stress according to ENT conditions were observed in this study, despite the lack of statistical significance between the DASS-21 score and the location of ENT complications. A study by Ong JY et al. showed that the prevalence of depression was high among HIV-positive patients [40]. Few retrospective studies claim that depression and anxiety among people with HIV are often underrecognized [40]. The authors recommend identifying the depression early and antidepressant treatment to be established as soon as possible. Screening with DASS-21 is useful for detecting depression in HIV patients [40].

CONCLUSION

The state of the immune system in patients with acquired immunodeficiency (HIV) can lead to a high prevalence of specific conditions in the ENT sphere. ENT diseases can serve as a red flag for a vulnerable immune state due to HIV. Greater ENT involvement is often associated with lower CD4 counts.

The most common ENT complications in HIV-infected patients include persistent oral candidiasis, laterocervical adenopathies, acute tonsillitis, acute and chronic rhinosinusitis, ear otomycosis, acute suppurative otitis media, and hairy leukoplakia of the tongue.

Physicians should be aware that ENT symptoms could raise the suspicion of HIV infection, thereby improving the early detection of HIV positivity.

The study highlights the evolving role of the ENT specialist in modern medicine, as a key member of the multidisciplinary care team for these patients. The ENT specialist plays an increasingly important role in thoroughly understanding the HIV-positive patient, particularly during the initial assessment, with a focus on immune status.

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REFERENCES

1. Tshifularo M, Govender L, Monama G. Otolaryngological, head and neck manifestations in HIV-infected patients seen at Steve Biko Academic Hospital in Pretoria, South Africa. *S Afr Med J.* 2013 May 16;103(7):464-6. http://doi.org/10.7196/samj.6786
2. Kirti YK, Yashveer JK, Poorey VK. Changing Trends of HIV/AIDS in Otorhinolaryngology with CD4 (+) Count Correlation. *Indian J Otolaryngol Head Neck Surg.* 2015 Mar;67(Suppl 1):12-5. http://doi.org/10.1007/s12070-014-0712-8
3. UNAIDS. Report on the global AIDS epidemic. 2010. Available: https://www.naids.org/globalreport/documents/20101123_GlobalReport_full_en.pd
4. Baccaglini L, Atkinson JC, Patton LL, Glick M, Ficarra G, Peterson DE. Management of oral lesions in HIV-positive patients. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2007 Mar;103 Suppl:S50.e1-23. http://doi.org/10.1016/j.tripleo.2006.11.002
5. Williams MA. Head and neck findings in pediatric acquired immune deficiency syndrome. *Laryngoscope.* 1987 Jun;97(6):713-6

6. Prasad HK, Bhojwani KM, Shenoy V, Prasad SC. HIV manifestations in otolaryngology. *Am J Otolaryngol.* 2006;27(3):179-85. http://doi.org/10.1016/j.amjoto.2005.09.011
7. Johnson NW, Glick M, Mbuguye TNL. Oral health and general health. *Adv Dent Res.* 2006 Apr 1;19(1):118-21. http://doi.org/10.1177/154407370601900122
8. Tappuni AR, Flemnming GJ. The effect of antiretroviral therapy on the prevalence of oral manifestations in HIV-infected patients: a UK study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001;92(6):623-8. http://doi.org/10.1067/moe.2001.118902
9. Hodgson TA, Greenspan D, Greenspan JS. Oral lesions of HIV disease and HAART in industrialized countries. *Adv Dent Res.* 2006;19(1):57-62. http://doi.org/10.1177/154407370601900112
10. CDC. Opportunistic infections | living with HIV | HIV basics | HIV/AIDS | CDC [Internet].Opportunistic infections. 2015. Available:https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html
11. National Institute of Allergy and Infectious Diseases. The HIV life cycle | understanding HIV/AIDS. 2020 Aug 13. Available: https://aidsinfo.nih.gov/understanding-hiv-aids/fact-sheets/19/73/the-hiv-life-cycle
12. Viswanatha B,Krisna N. Otolaryngologic manifestations of HIV infection. *J Hematol Malig.* 2012;2(2):33-8. http://doi.org/10.5430/jhm.v2n2p33
13. 13. Prasad HK, Bhojwani KM, Shenoy V, Prasad SC. HIV manifestations in otolaryngology. *Am J Otolaryngol.* 2006 May-Jun;27(3):179-85. http://doi.org/10.1016/j.amjoto.2005.09.011
14. Lubbe DE. HIV and ENT. *Contin Med Educ.* 2004;22(5):2002-5.
15. Taipale A, Pelkonen T, Taipale M, et al. Otorhinolaryngological findings and hearing in HIV-positive and HIV-negative children in a developing country. *Eur Arch Oto-Rhino-Laryngology.* 2011 Oct;268(10):1527-32. http://doi.org/10.1007/s00405-011-1579-x
16. Sanjar FA, Queiroz BE, Miziara ID. Otolaryngologic manifestations in HIV disease: clinical aspects and treatment. Braz J Otorhinolaryngol. 2011 Jun;77(3):391-400. http://doi.org/10.1590/s1808-86942011000300020
17. Van Der Westhuizen Y, Swanepoel de W, Heinze B, Hofmeyr LM. Auditory and otological manifestations in adults with HIV/AIDS. *Int J Audiol.* 2013 Jan;52(1):37-43. http://doi.org/10.3109/14992027.2012.721935
18. HRC. How HIV impacts LGBTQ people. 2021 May. Available: https://www.hrc.org/resources/hrc-issue-brief-hiv-aids-and-the-lgbt-community
19. CDC Fact Sheet. Today's HIV/AIDS epidemic. The scope and impact of HIV in the United States. 2021 May. Available: https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/cdc-msm-508.pdf
20. Tamara E, Sanders EJ, Doherty M, et al. Challenges of HIV diagnosis and management in the context of pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP), test and start and acute HIV infection: a scoping review. *J Int AIDS Soc.* 2019;22(12):e25419. https://doi.org/10.1002/jia2.2541
21. Shieh E, Marzinke MA, Fuchs EJ, et al. Transgender women on oral HIV pre-exposure prophylaxis have significantly lower tenofovir and emtricitabine concentrations when also taking oestrogen when compared to cisgender men. *J Int AIDS Soc.* 2019;22(11):e25405. http://doi.org/10.1002/jia2.25405
22. Swai H. Otorhinolaryngological manifestations among HIV infected patients attending HIV clinic at Muhimbili. Muhimbili Uni. Of Health and Allied Sciences. 2011. http://ihi.eprints.org/927/1/muhas(5).pdf
23. Shija PS, Karaba JA, Philemon RN, Minja BL, Mtenga PP, Katundu DR. Prevalence of Ear Nose and Throat (ENT) Manifestations Among HIV Seropositive Patients at a Tertiary Hospital in Northern Tanzania: A Descriptive Cross-Sectional Study. *HIV AIDS (Auckl).* 2020;12:425-9. http://doi.org/10.2147/HIV.S260908
24. Bao S, Shao S. Otorhinolaryngological profile and surgical intervention in patients with HIV/AIDS. *Sci Rep.* 2018 Aug 13;8(1):12045. http://doi.org/10.1038/s41598-018-27761-y
25. Tshifularo M, Govender L, Monama G. Otolaryngological, head and neck manifestations in HIV-infected patients seen at Steve Biko Academic Hospital in Pretoria, South Africa. *S Afr Med J.* 2013;103(7):464-6. http://doi.org/10.7196/samj.6786
26. Kirti YK, Yashveer JK, Poorey VK. Changing Trends of HIV/AIDS in Otorhinolaryngology with CD4 (+) Count Correlation. *Indian J Otolaryngol Head Neck Surg.* 2015;67(suppl 1):12-5. http://doi.org/10.1007/s12070-014-0712-8
27. Prasad HK, Bhojwani KM, Shenoy V, Prasad SC. HIV manifestations in otolaryngology. *Am J Otolaryngol.* 2006;27(3):179-85. http://doi.org/10.1016/j.amjoto.2005.09.011
28. Bakhshaee M, Sarvghad MR, Khazaeni K, Movahed R, Hoseinpour AM. HIV: An Epidemiologic study on Head and Neck Involvement in 50 Patients. *Iran J Otorhinolaryngol.* 2014;26(2):97-103. http://doi.org/10.22038/ijorl.2014.2329
29. Jafari S, Razmpa E, Saeedinejad Z, et al. Otolaryngological manifestations in HIV infected patients, Tehran, Iran. *J AIDS Clin Res.* 2012;3(6):3-6. http://doi.org/10.4172/2155-6113.1000160
30. Yan Y. et al. Shift in HIV/AIDS Epidemic in Southeastern China: A Longitudinal Study from 1987 to 2015. *Int J Environ Res. Public Health.* 2016;13(8):794. http://doi.org/10.3390/ijerph13080794
31. He H, et al. Look into the HIV Epidemic of Gay Community with a Socio-Cultural Perspective: A Qualitative Study in China, 2015-2016. *PloS one.* 2017;12(1):e0170457. http://doi.org/10.1371/journal.pone.0170457
32. Deb T, Singh NB, Devi HP, Sanasam JC. Head and Neck manifestations of HIV infection. A preliminary study. *J Indian Med Assoc.* 2003 Feb;101(2):93-5
33. Prasad HK, Bhojwani KM, Shenoy V, Prasad SC. HIV manifestations in otolaryngology. *Am J of Otolaryngol.* 2006;27(3):179-85. http://doi.org/10.1016/j.amjoto.2005.09.011
34. Tanzania Commission for AIDS (TACAIDS), Zanzibar AIDS Commission (ZAC), National Bureau of Statistics (NBS), Office of Chief Government Statistician (OCGS) and ICF International. Tanzania HIV/AIDS and Malaria Indicator Survey 2011-2012. Dar es Salaam. 2013. https://dhsprogram.com/pubs/pdf/AIS11/AIS11.pdf
35. Weledji EP, Nsagha D, Chichom A, Enoworock G. Gastrointestinal surgery and the acquired immune deficiency syndrome. *Ann Med Surg (Lond).* 2015 Jan;4(1):36-40. http://doi:10.1016/j.amsu.2014.12.001
36. Shanthamurthy D, Manesh A, Zacchaeus NG, Roy LR, Rupali P. Perioperative outcomes in human immunodeficiency virus-infected patients - the PRO HIV study. *Int J STD AIDS.* 2018 Sep;29(10):968-73. http://doi.org/10.1177/0956462418764485
37. Feng T, Feng X, Jiang C, Huang C, Liu B. Sepsis risk factors associated with HIV-1 patients undergoing surgery. Emerg Microbes Infect. 2015 Sep 23;4(9):e59. http://doi: 10.1038/emi.2015.59
38. Kligerman MP, et al. Otorhinolaryngology/Head and Neck Surgery in a low income country: The Haitian experience. *Int J Pediatr Otorhinolaryngol.* 2017;93:128-32. http://doi.org/10.1016/j.ijporl.2016.12.041
39. Feng T, Feng X, Jiang C, Huang C, Liu B. Sepsis risk factors associated with HIV-1 patients undergoing surgery. *Emerg Microbes Infect.* 2015 Sep 23;4(9):e59. http://doi.org/10.1038/emi.2015.59
40. Ong JY, Yee A, Amer Nordin AS, Danaee M, Azwa RI. The prevalence of depression, anxiety and associated factors among adults with living human immunodeficiency virus in University Malaya Medical Centre. *Int J STD AIDS.* 2022 Sep;33(10):880-889. http://doi.org/10.1177/09564624221106528
41. Campanini A, Marani M, Mastroianni A, Cancellieri C, Vicini C. Human immunodeficiency virus infection: personal experience in changes in head and neck manifestations due to recent antiretroviral therapies. *Acta Otorhinolaryngol Ital.* 2005 Feb;25(1):30-5. PMID: 16080313; PMCID: PMC2639849