Oral Manifestations of HIV Infection in Patients Receiving Highly Active Antiretroviral Therapy (HAART) in Bahia, Brazil

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Abstract

Objectives: *We investigated the oral manifestations of HIV-infected patients in Salvador, Brazil, and their relationship to immunologic, sociodemographic, and therapeutic factors.* ***Methods:*** *This was a cross-sectional study that used data from adult patients' medical records in the dentistry service of the AIDS Reference Center in Salvador, Brazil. We reviewed the patients' records to collect information concerning oral health status and data on socioeconomic status, immunologic status, and treatment.* ***Results:*** *A total of 993 patients were included in the study, of whom 473 (47.6 percent) were male. Approximately 5.5 percent of the patients presented with any oral lesions. Oral lesions were the most common in the patients with fewer than 350 CD4+ T lymphocytes (8.4 percent) and with viral loads greater than 10,000 copies (8.3 percent).* ***Conclusions:*** *Our study shows that lesions are more common in patients with advanced immune suppression and low level of schooling. Oral candidiasis and angular chelitis were the most common lesions seen.*

Key Words: oral manifestations, HAART, oral lesions, HIV, Brazil

Introduction

The patterns of morbidity and mortality from the HIV and AIDS epidemic have changed considerably in Brazil since its appearance in the 1980s (1). Oral lesions, mainly candidiasis, hairy leukoplakia, Kaposi's sarcoma, linear gingival erythema, and periodontal disease have been documented. These oral manifestations are the earliest indicators of HIV infection in both developed and developing countries. They may provide a strong indication of HIV infection (2).

Moreover, persistent candidiasis and hairy leukoplakia, in particular, are strongly associated with immune suppression and progression of HIV disease. However, recent studies have reported declines in the prevalence of oral lesions and the emergence of new oral manifestations among AIDS subjects, mainly after the introduction of highly active antiretroviral therapy (HAART) (3).

In Brazil, the few studies that have been done are descriptive, have used small samples, and most had neither the subjects' immunologic status available nor examined the relationship between oral health status and HIV infection (4). In addition, few studies have also evaluated the effect of HAART on oral lesions and oral health status. HAART has become widely available in Brazil since 1996, where a policy of universal access to antiretroviral therapy has guaranteed the free distribution of antiretroviral drugs to those that access public health services (5).

The objective of this paper was to investigate the oral health status and the occurrence of oral manifestations of HIV infection as associated with socioeconomic, immunologic, and therapeutic factors in patients attending the dental public service of the State AIDS Reference Center in Salvador, Brazil.

Methods

Study Setting, Population and Design. The AIDS public service, also known as CREAIDS, has been the reference center for HIV patients from both the capital city of Salvador and other cities in the state of Bahia since 2001. Bahia is a state in the northeast of Brazil that lies near the equator and is characterized by higher rates of social inequality, lower life expectancy, and higher infant mortality than in other more affluent states in the south and southeastern regions of the country.

This study used a cross-sectional design, and all patients older than 13 years of age who were seen at CREAIDS' dentistry service during the period of January 2003 to December 2005 were eligible to participate in the study. The study population included patients who were referred for diagnosis and management of oral lesions, as well as those attending for routine examinations. In that center, all patients who were undergoing an antiretroviral treatment used HAART and systemic medications to prevent and/or treat

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opportunistic infections. Out of the 1,185 patients enrolled in the dentistry service, 83.8 percent had available records and were eligible to participate in this study.

In Brazil, the treatment for HIV patients always includes three drugs (two nucleoside reverse transcriptase inhibitors associated with one non-nucleoside reverse transcriptase inhibitor or one protease inhibitor) according to the recommendations of the National AIDS Program of the Ministry of Health. These recommendations are reviewed periodically by an ad hoc committee (6).

Data Collection. We reviewed the data from the medical and dental records of patients who presented a confirmed diagnosis of HIV infection. The dental records included information on observed oral lesions, oral hygiene, and other clinical signs. Diagnosis of oral and dental lesions was based on the clinical appearance during examination and was recorded as present or absent on a standardized screening sheet. The lesions were classified using the standardized presumptive diagnostic criteria proposed by the World Health Organization (WHO) in 1993 (7).

At the clinic, all patients were assisted by a multidisciplinary team and were asked for the use of data for research purposes. A single dentist conducted all oral examinations, and only the first exam was considered for this study.

Information on demographics, immunologic variables, and the time on use of HAART were abstracted from the medical records and reference center database. The patients' records were reasonably complete, with most missing data on sociodemographics and few on immunologic data.

Data Analysis. We compared the proportions using either Pearson's χ^2 or Fisher's test (extended version), and the Chi-square test for linear tendency was used to evaluate the prevalence of oral lesions over time. We analyzed the data using EPI-INFO 6.03 (CDC, Atlanta, GA) and Stata 7.0 (Stata Corp., College Station, TX).

This study was approved by the Committee on Ethics and Research of the Instituto de Saúde Coletiva, Federal University of Bahia, and by the institutional review board of the Grupo Hospitalar Conceição in Porto Alegre state, south of Brazil.

Results

A total of 993 patients participated in the study. The median age was 36.4 years (13 to 80 years). There were slightly more women (52.4 percent) than men (47.6 percent). Most patients had completed their primary education (52.7 percent) and were single (68.8 percent). Women were predominantly employed as domestic workers (50 percent) or were students (12 percent). Men's occupations were much more diverse, e.g., students (16 percent), drivers (6 percent), or construction workers (5 percent). Sixty-six percent of the studied patients were using HAART. Three hundred and ninety patients (39.3 percent) had been using HAART for over 6 months.

Overall, 5.5 percent of the patients had specific oral lesions diagnosed during the period of the study. Patients with CD4+ T lymphocyte counts $\leq$350 cells/mm^3 (8.4 percent) were more likely to have oral lesions than those with $\geq$500 cells/mm^3 (1.4 percent, $P < 0.05$). Similarly, patients with plasma viral loads $\geq$10,000 copies/mL were significantly more likely to have lesions than those with plasma viral loads $\leq$500 copies/mL. In addition, subjects receiving HAART without protease inhibitors (PI) had a lower proportion of oral lesions than those on therapy and antiretroviral therapy with PI ($P < 0.05$).

The most common lesions were candidiasis (3.9 percent) and angular chelitis (1.2 percent); hairy leukoplakia, herpes simplex, and Kaposi's sarcoma were substantially less common. Moreover, the large majority of patients had dental disease. Among all participants, 29.6 percent had more than 10 decayed, missing, or filled teeth, 82.7 percent had current dental cavities, 53.4 percent had dental calculus, and 90.5 percent needed one or more therapeutic dental prostheses.

Patients with a low level of schooling had a higher prevalence of oral lesions, with an ascending linear tendency from 2003 to 2005. Those using HAART without PI had a lower prevalence than those using PI in every year of the study. Those with low CD4 cells and high viral load also had a higher frequency of oral lesions in every year of the study (Table 1).

Discussion

In our study, we found that 5.5 percent of the HIV-infected patients assisted by the dental clinic of an HIV/AIDS reference center had any oral lesion. The frequency of lesions was somewhat stable over the three studied years, 2003-05. The prevalence was much lower when compared with studies on adults receiving HAART in developing countries (8). The lower prevalence of oral lesions may be explained by the cross-sectional nature of our study. Some lesions may have already been diagnosed and treated, especially candidiasis. Another possibility is the high rate of HAART use in our population, as HAART is known to be associated with a decrease in oral lesions. Furthermore, we did not follow the patients longitudinally and were unable to observe the associations between immunologic progression, viral replication, and change of antiretroviral drugs and the occurrence and resolution of these lesions.

The most frequent oral lesions were candidiasis, followed by angular chelitis, herpes simplex, and hairy leukoplakia. Similar to findings from other studies, the diagnosed oral lesions were more prevalent in patients with lower CD4 lymphocyte counts and higher plasma viral loads (9).

Previous studies have reported that oral lesions are significantly reduced in patients on PI-HAART. However, in our study, we found a lower frequency of oral lesions in patients receiving HAART without PI.

Table 1
Sociodemographic, Therapeutic, and Immunologic Characteristics and Prevalence of Oral Lesions in Subjects Assisted at the Dentistry Service of CREAIDS, Salvador, Brazil

	All subjects with oral lesions		Study year					
			2003 (6.0%)		2004 (4.7%)		2005 (5.8%)	
Characteristics	*n*	%	*n*	%	*n*	%	*n*	%
Age (years)								
13-25	108	0.9	31	3.2	42	0.0	35	0.0
26-35	382	5.2	136	5.9	117	5.1	129	4.7
36-45	348	7.2	142	7.8	116	7.8	90	5.6
>45	155	5.8	56	3.6	42	0.0	57	12.3
Sex								
Female	520	7.4	199	7.5	161	5.0	160	7.5
Male	473	3.8	166	4.2	156	4.5	151	4.0
Education†								
Illiterate	21	14.3	5	0.0	8	25.0	8	12.5
Primary school*	413	4.1	136	0.7	143	4.2	134	7.5
Secondary school	308	6.5	112	9.8	104	5.8	92	3.3
University	42	0.0	16	0.0	13	0.0	13	0.0
Marital status‡								
Single	660	5.8	250	6.0	213	5.6	197	5.6
Married	216	5.6	76	5.3	72	4.2	68	7.4
Widowed	45	4.4	17	5.9	15	0.0	13	7.7
Separated	38	2.6	14	7.1	13	0.0	11	0.0
Use of HAART								
Yes, with protease inhibitors	362	7.1	114	10.4	102	5.9	146	5.5
Yes, without protease inhibitors	298	2.7	101	1.0	120	4.2	77	2.6
No	333	6.3	150	6.0	95	4.2	88	9.1
Time on use of HAART								
At least 6 months	270	7.0	109	7.3	104	4.8	57	10.3
Above 6 months	390	3.8	106	4.7	118	5.1	166	2.4
None	333	6.3	150	6.0	95	4.3	88	9.2
CD4+ T lymphocyte count								
Low (<350) cells/mm^3	510	8.4	196	10.2	156	6.4	158	8.2
Medium (350-500) cells/mm^3	188	3.7	68	1.5	60	5.0	60	5.0
High (>500) cells/mm^3	287	1.4	98	1.0	97	2.1	92	1.1
Viral load level§								
Low (<500) copies/mL	332	3.3	152	2.6	95	2.1	85	5.9
Medium (500-10,000) copies/mL	189	2.6	68	0.0	62	3.2	59	5.1
High (>10,000) copies/mL	458	8.3	138	12.3	157	7.0	163	6.1

* Significant trend over time, *P*-value less than 0.05; χ^2 test for trend.
† Two hundred and nine missing.
‡ Thirty-four missing.
¶ Eight missing.
§ Fourteen missing.
HAART, highly active antiretroviral therapy.

It is possible that in our study with a cross-sectional design, patients using PI-HAART were on an advanced stage of the disease and presenting opportunistic manifestations, different from those that are asymptomatic and not yet on HAART. Furthermore, the design of the study adopted in this research does not allow the evaluation of the effect of the use of antifungal therapy on the occurrence of oral lesions. Moreover, the WHO, in a recent publication about oral lesions and HIV disease, concluded that there is a need to centralize research efforts in developing countries to support longitudinal studies on oral lesions as surrogate markers for the initiation of antiretroviral therapy (10).

The findings on oral health status cannot be compared with the reference population because the method used in general population surveys is based on other standardized criteria for the diagnosis and classification of oral health status. Additionally, we were unable to obtain any information on periodontal disease; just the presence of calculus was accessible in our database. Further research and health promotion programs should investigate periodontal conditions. Moreover, we recommend that

HIV-infected patients have access to oral health services as part of the health care.

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