

Oral health management of 97 patients living with HIV/AIDS in Ribeirão Preto, São Paulo, Brazil

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Abstract: Considering the changes antiretroviral therapy (ART) has brought to the treatment of HIV infection, the current clinical and laboratory profiles of HIV/AIDS individuals referred to oral health centers are crucially important in instructing dentists about the oral health management of these patients. The aim of the present study was to determine the clinical and laboratory profiles of HIV-infected individuals referred to a clinic for patients with special needs between 2005 and 2012 by retrospectively analyzing their dental records. A total of 97 records of HIV patients referred to the School of Dentistry of Ribeirão Preto, *Universidade de São Paulo - USP*, were analyzed. The Mann-Whitney test was used to determine the associations between mean CD4⁺ counts, mean viral load, and the presence of HIV-related oral lesions (HIV-OL). Most of the patients were male, and their mean age was 38.3 years. Eighty-nine (92%) patients were on regular ART, 77 (79.4%) had a CD4⁺ count higher than 200 cells/mm³, and 63 (64.9%) had an undetectable viral load. Twenty patients (20.6%) presented with some HIV-OL, including pseudomembranous and/or erythematous candidiasis and angular cheilitis, which were correlated with a low CD4⁺ count and with an undetectable viral load ($p < 0.05$). Among the branches of dentistry, periodontics, followed by surgery and restorative dentistry, was the most sought-after specialty, and no intercurrent events were observed during the dental treatment. It may be concluded that there are no restrictions on the dental treatment of patients on regular ART, It is important, though, that the treatment be based on local characteristics and on the prevention of oral diseases.

Keywords: HIV Infections; Dental Care; Mouth Mucosa.

Introduction

The acquired immunodeficiency syndrome (AIDS) prevents the immune system from inhibiting the continuous replication of the human immunodeficiency virus (HIV), which, in turn, reduces cell-mediated immunity, thus predisposing to the development of opportunistic diseases.¹ Although the global number of new HIV infections has declined by 19% over the past decade, the disease remains endemic and is still a major health public problem worldwide.² In Brazil, it is estimated that 734,000 people were living with HIV until 2014, with 39.7 new cases registered

annually in the last five years. In total, 278,306 people died of AIDS between 1980 and 2013.³

The combined use of antiretroviral drugs, since 1996, has resulted in a significant decrease in the incidence of opportunistic infections and in lower mortality rates, in addition to improving the quality of life of these patients.⁴ Notwithstanding, multidisciplinary approaches to HIV-infected patients are still needed, given their physical and social conditions.⁵ HIV patients may present with HIV-related oral lesions (HIV-OL) and bone marrow abnormalities, both of them of importance to dental practitioners. The former may affect 80% of the patients diagnosed with AIDS⁶ and are important markers of immunosuppression, whereas the latter include different degrees of dysplasia in one or more cell lines, which may be strongly associated with peripheral blood cytopenia, resulting in anemia, granulocytopenia, and thrombocytopenia.^{7,8,9} These two groups of disorders usually cause uncertainty among dentists about the diagnosis of HIV-OL and also about the risk of infections and excessive bleeding after dental procedures.

Considering the changes in the management of HIV infection brought about by antiretroviral therapy (ART), and also the uncertainty surrounding the dental treatment of this group of patients, it is paramount that the current clinical and laboratory profiles of HIV-infected patients referred to oral health centers be provided, helping dentists with the oral health management of these patients and also contributing to reducing the stigma associated with the disease. Thus, the aim of the present study was to build up the clinical and laboratory profiles of HIV-infected individuals referred to a clinic for patients with special needs of the School of Dentistry of Ribeirão Preto, São Paulo, Brazil.

Methodology

Patients

Records of HIV individuals treated at the clinic for patients with special needs of the School of Dentistry of Ribeirão Preto, *Universidade de São Paulo - USP*, between 2005 and 2012, and also treated at the Special Unit for the Treatment of Infectious Diseases (*Unidade Especial de Tratamento em Doenças*

Infeciosas - UETDI) of the Clinical Hospital, School of Medicine of Ribeirão Preto (*Hospital das Clínicas, Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo - HC-FMRP-USP*), University of São Paulo, were included in the study. The study protocol was approved by the Research Ethics Committee of the School of Dentistry of Ribeirão Preto (CAAE: 0088.0.138.000-10), and all patients signed a written informed consent form in accordance with the Declaration of Helsinki.

Methods

Information about age, sex, diagnosis of HIV infection, CD4⁺ count, viral load, opportunistic infections, coinfections, noninfectious comorbidities, ART, presence of HIV-OL, and type of dental treatment required was investigated. All patients should be 18 years or older and have recent CD4⁺ and viral load results. Both CD4⁺ count and viral load were checked immediately before starting the dental treatment, and four months later if the duration of dental treatment was longer than four months. The oral cavity was evaluated in different time periods based on the number of dental appointments required for the whole dental treatment. Regarding ART, the patients whose treatment compliance was confirmed by the analysis of their records were considered to be on regular ART, and those without treatment compliance were considered to be on irregular use of ART. A complete blood count was obtained from those patients who required oral surgical procedures.

Statistical analysis

The Mann-Whitney test was used to estimate the significance in the difference between mean CD4⁺ count and median viral load, and their associations with the presence of HIV-OL. Statistical significance was assumed when $p < 0.05$. All statistical analyses were performed using the GraphPad Software Inc (San Diego, California, USA).

Results

Patients' characteristics

Records of 97 HIV patients were included in this study, and their clinical and laboratory

profiles are described in Table 1. HIV infection was diagnosed by ELISA and confirmed by the Western blot technique in all patients, and HIV-OL were identified according to the Classification and Diagnostic Criteria for Oral Lesions in HIV Infection.¹⁰ The mean age of HIV patients was 38.3 ± 10.46 with a range of 6 to 61 years, and there was a predominance of male individuals (67/97; 69.1%). Most of the patients had a CD4⁺ count higher than 200 cells/mm³ (77/79.4%) and an undetectable viral load (63/64.9%). The most frequent opportunistic infections were cerebral toxoplasmosis and pneumonia, while hepatitis C (10/10.3%) and tuberculosis (9/9.2%) were the most frequent coinfections. Some patients presented with noninfectious comorbidities, including diabetes mellitus, hypertension, and hyperlipidemia. Eighty-nine patients (92%) were on regular ART and had been treated for an average of two years and four months (range: three months to 12 years). Only eight patients (8%) did not use ART regularly.

Twenty patients (20.6%) presented with some HIV-OL, including pseudomembranous and/or erythematous candidiasis (Figure 1a), and angular cheilitis (Figure 1b). Seventeen patients (17.5%) had only one HIV-OL, two patients (2.06%) presented with two different HIV-OL, and only one patient (1.03%) presented with three HIV-OL simultaneously. Only HIV-related oral fungal infections were considered. Those related to a removable prosthesis were excluded. The types and frequency of HIV-OL found in this study are described in Table 2. In general, the presence of HIV-OL was correlated with a low CD4⁺ count and with an undetectable viral load (Figures 2a and 2b). The 20 patients with HIV-OL had a mean CD4⁺ count of 277 cells/mm³, compared to 506 cells/mm³ in the 73 patients without HIV-OL. Conversely the CD4⁺ count, patients who presented with any HIV-OL had a mean viral load of 62 copies/mL and patients who did not present HIV-OL had a mean viral load lower than 50 copies/mL.

Among the branches of dentistry, periodontics, followed by surgery and restorative dentistry, was the most sought-after specialty (Table 3). In general, the complete dental treatment required between one and 18 weeks (mean of 10 weeks), depending on the

patient's needs. Only three patients required more than four months for prosthetic rehabilitation. A complete blood count was obtained from patients (n = 42) who required oral surgical procedures. No patient had a neutrophil count of less than 500 cells/mL and a platelet count of less than 50,000 cells/mm³. There was no intercurrent event during the dental treatment of these patients; no prophylactic antibiotic was necessary; and there was no hemorrhagic episode associated with invasive procedures.

Table 1. Clinical profile of HIV-infected patients referred to the clinic for patients with special needs of the School of Dentistry of Ribeirão Preto, USP, from 2005 to 2012.

Parameters	N (%)
Age (median; range)	38.3 ± 10.46 (9-61)
Sex	
Female	30 (30.9)
Male	67 (69.1)
CD4 ⁺ count	
< 200	20 (20.6)
200 to 500	43 (44.3)
> 500	34 (35.1)
Viral load	
> 50 copies	34 (35.1)
< 50 copies*	63 (64.9)
Opportunistic infections**	
Cerebral toxoplasmosis	12 (12.3)
Pneumonia	10 (10.3)
Histoplasmosis	2 (2)
Cytomegalovirus infection	2 (2)
Coinfections	
Viral hepatitis†	13 (13.4)
HCV	10 (10.3)
HBV	3 (3)
HAV	1 (1)
Tuberculosis	9 (9.2)
Noninfectious comorbidities	
Hypertension	5 (5.1)
Diabetes mellitus	3 (3)
Hyperlipidemia	3 (3)
Regular ART	
Yes	89 (91.7)
No	8 (8.2)

HCV: hepatitis C virus; HBV: hepatitis B virus; HAV: hepatitis A virus; ART: antiretroviral.

*Undetectable viral load.

**excluding HIV-OL.

†one patient presented with hepatitis B and C.

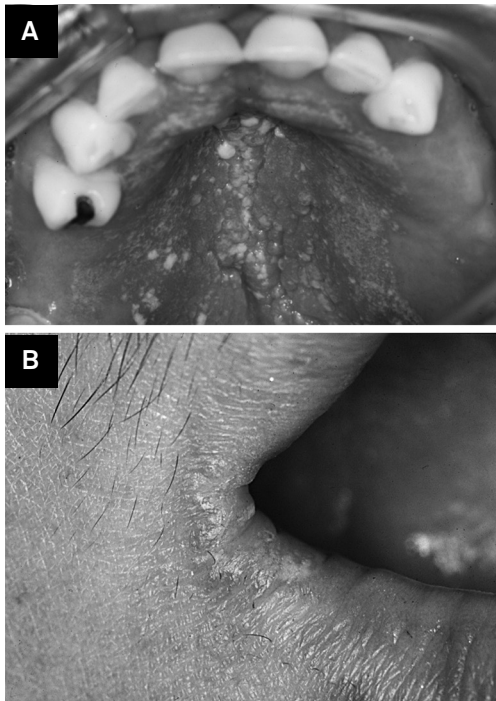


Figure 1. (A) Clinical manifestation of pseudomembranous candidiasis in an HIV patient; (B) Clinical manifestation of angular cheilitis in an HIV patient.

Table 2. Prevalence of HIV-OL diagnosed during oral examination.

Oral Lesions	N (%)
Candidiasis	9 (9.3)
Erythematous candidiasis	5 (5.1)
Pseudomembranous candidiasis	4 (4.1)
Angular cheilitis	3 (3)
Oral hairy leukoplakia	3 (3)
Idiopathic ulcers	3 (3)
Herpes simplex	3 (3)
Kaposi's sarcoma	2 (2)
Herpes zoster	1 (1)

Discussion

This study analyzed the clinical and laboratory profiles (CD4⁺ count and viral load) of HIV patients referred to a specialized oral health center. Most of the HIV-infected patients in this study were male (67/69%) and the male to female ratio was 2.23:1. Male predominance was demonstrated by previous studies conducted in Brazil and also in other countries, such as Mexico, India, and Nigeria.^{11,12,13,14} The mean age of our patients was 38.3 ± 10.46. This finding is also

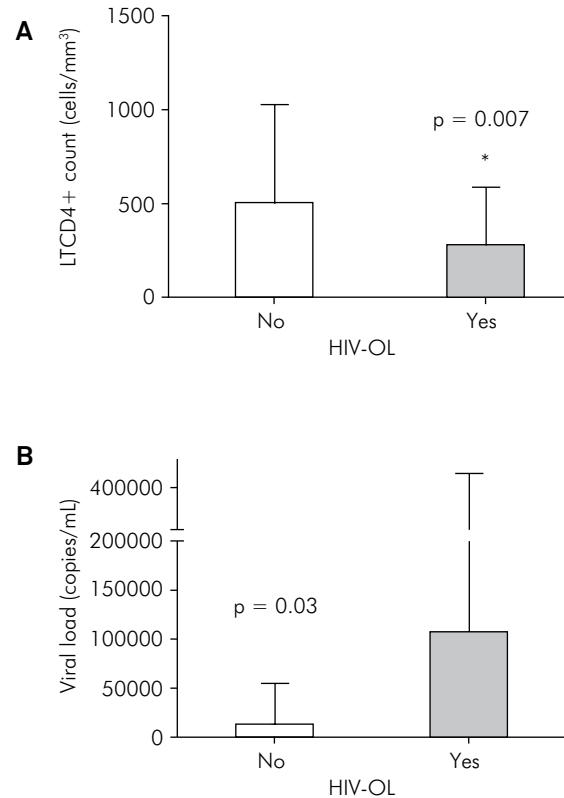


Figure 2. (A) Distribution of CD4⁺ count based on the presence or not of HIV-OL in 97 patients living with HIV/AIDS in Ribeirão Preto, Brazil, referred to the clinic for patients with special needs of the School of Dentistry of Ribeirão Preto, USP, from 2005 to 2012; (B) Distribution of viral load based on the presence or not of HIV-OL in 97 patients living with HIV/AIDS in Ribeirão Preto, Brazil, referred to the clinic for patients with special needs of the School of Dentistry of Ribeirão Preto, USP, from 2005 to 2012.

Table 3. Prevalence of dental specialties among HIV-infected patients.

Specialties*	N (%)
Periodontics	51 (52.5)
Surgery	42 (43.2)
Restorative dentistry	34 (35)
Prosthetic dentistry	30 (31)
Endodontics	17 (17.5)
Occlusion	1 (1)
Oral and maxillofacial prosthodontics	1 (1)

*In some cases, more than one dental specialty was required.

consistent with several studies that reported a high number of patients with a mean age between the third and fourth decades of life.^{11,12,13,14,15} The male

predominance and age range observed in the present study might be due to the profile of this sexually and economically active population.

Candidiasis is the most common opportunistic infection among HIV-infected patients.¹⁶ In the present study, there was a high prevalence of erythematous and pseudomembranous candidiasis among HIV-OL. As it would be difficult to rule out any systemic influence on fungal lesions, those cases of candidiasis that healed after adherence to hygiene recommendations and after the placement of new removable prostheses were regarded as denture stomatitis rather than as HIV-OL. Our data are consistent with previous studies that demonstrate candidiasis is the most common HIV-OL.^{11,14} Two interesting Nigerian studies^{15,17} observed pseudomembranous candidiasis as the most frequent HIV-OL, followed by cheilitis and erythematous candidiasis. In a previous study, pseudomembranous candidiasis was detected in 10.8% of participants, angular cheilitis in 13.9%, oral hairy leukoplakia in 11.8%, and erythematous candidiasis in 6.9%.¹⁸

CD4⁺ count, along with the presence of opportunistic infections, remains one of most reliable parameters for the clinical staging of patients and for the decision of when to initiate treatment.¹⁹ In the present study, the prevalence of HIV-OL was strongly associated ($p = 0.007$) with low CD4⁺ levels (usually less than 200 cells/mm³). Similarly to our results, Adurogbangba *et al.*²⁰ reported a strong association between HIV-OL and low CD4⁺ counts, mainly when the latter were below 500 cells/mm³. As with CD4⁺ counts, viral load is also related to oral manifestations. Participants of the current study with a high viral load showed a higher frequency of HIV-OL, regardless of their CD4⁺ count ($p = 0.03$). Bravo *et al.*,²¹ in Venezuela, also observed a strong association between the prevalence of oral lesions and HIV viral load, regardless of the CD4⁺ count. Although the CD4⁺ count has been considered a better indicator of disease progression, a high viral load may be strongly associated with HIV-OL, regardless of the cell-mediated immunity, as demonstrated in our study.

Asymptomatic HIV patients can be treated as any other dental patient, as shown with the 97 patients of this study. Nowadays, few patients need to have their treatment plan modified, since ART keeps the

immune system generally stable.²² However, no consensus exists over the indications of antibiotics in conjunction with dental procedures, especially those that cause bleeding. There is no scientific evidence that supports the need of antibiotic prophylaxis to prevent bacteremia and/or oral complications after dental procedures in HIV patients.^{23,24,25} Some authors, however, recommend antibiotic prophylaxis before invasive dental procedures (dental surgery or periodontal treatment) in patients with a CD4⁺ count lower than 200 cells/mm³ associated with a neutrophil count of less than 500 cells/mL.²⁶ As no patients presented any of the problems mentioned above, owing possibly to the fact that 92% were on ART, we did not treat them with antibiotic prophylaxis.

Although rare, HIV patients may present with immune thrombocytopenia as a complication of HIV infection; however, only severe thrombocytopenia (less than 50,000 cells/mm³) leads to excessive bleeding during invasive dental procedures.^{22,25} Among the participants of the present study, none had a platelet count of less than 50,000 cells/mm³, and no excessive bleeding was verified in those patients submitted to periodontal treatment and/or oral surgery.

Conclusion

No intercurrent events related to dental treatment were observed in this study, and few patients presented with HIV-OL. Despite the risks of HIV-OL and of oral complications after dental procedures discussed in this paper, there are no restrictions on the dental treatment of stable patients on regular ART. It is important, though, that the treatment be based on local characteristics and on the prevention of oral diseases. The presence of HIV-OL was directly associated with a low CD4⁺ count and with a high viral load, confirming the efficacy of these parameters as markers of immunosuppression.

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