

Effect of HAART on the Oral Manifestations in Human Immunodeficiency Virus Positive Patients: A Clinical Study, Tiruchirappalli, Tamil Nadu

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Abstract

Introduction: Human immunodeficiency virus (HIV) infection remains as a pandemic health problem. The development of highly active antiretroviral therapy (HAART) has significantly altered the course of HIV disease into a manageable disease with enhanced quality of life chiefly in the developed countries. Very limited studies have been made available concerning the effect of HAART on oral lesions in developing countries like India.

Aims and Objectives: (1) To compare the oral lesions in HIV-seropositive patients between those who are newly diagnosed and those actively undergoing HAART and (2) To determine the therapeutic effects of HAART on oral lesions in HIV-seropositive patients.

Materials and Methods: Screening was done among the patients attending the VCTC Centre at Government Hospital, Tiruchirappalli. Screening was conducted on 240 patients both male and females who were confirmed with HIV positive status with CD4 count <200 cells/mm³ were selected for the study. Out of these, 136 patients were already under HAART for the past 3 months and the rest 104 patients were newly diagnosed as HIV-patient, yet treatment to be started. The soft tissues of the oral cavity were examined thoroughly for the presence of any lesions. The results were tabulated in a standard form, and they were statistically analyzed using Chi-square test.

Results: The incidence of periodontal disease was decreased in patients under HAART after 3 months. There was strong decline in the severity of oral candidiasis, but there were increased the incidence of melanotic hyperpigmentation.

Conclusion: The oral manifestations of HIV infection have changed due to the advent of HAART. Many opportunistic infections have the fastest response to HAART as a result of an improved immune system. These lesions alongside immunologic parameters can be used as indicators of success or failure of antiretroviral therapy.

Key words: CD4 cell counts, Highly active antiretroviral therapy, Human immunodeficiency virus patients, Oral manifestations

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is an infectious disease caused by human immunodeficiency virus (HIV) and it is a highly lethal, progressively epidemic

viral infection characterized by profound impairment of the immune system that leads to opportunistic infections and secondary neoplasm.¹ The mortality rate is decreasing due to improvements in treatment regimen and increased access to anti-HIV drugs.^{2,3} The management modalities that have brought the mortality rates in the developed world down are the antiretroviral therapy (ART), especially the highly active ART (HAART).^{4,7}

HIV is a retrovirus, which has a specific affinity for CD4 cells (T-helper cells).¹ CD4 count helps in evaluating disease diagnosis, progression, prognosis, and making the decision for ART.

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According to the new classification given by Center for Disease Control and Prevention, clinical AIDS is defined by a CD4 count of <200 and/or a CD4 <14%.⁸

One important factor to be considered to reduce the mortality and morbidity rates for patients with HIV is early diagnosis and identification of features with prognostic significance. In this regard, oral manifestations of AIDS have played a very important role and some of the oral lesions have both diagnostic and prognostic values.⁹⁻¹¹ The occurrence of oral manifestations is favored by immune deterioration.¹² Oral manifestations are seen in 30-80% of HIV patients. The more common of the oral lesions that occur along with HIV are the candidiasis, hyperpigmentation, angular cheilitis, gingivitis, periodontitis, aphthous ulcers, herpes simplex infections, and oral hairy leukoplakia of which oral candidiasis is of significance as far as prognostic indicators of immune suppression are concerned.¹³⁻¹⁵

The aim of our study is to compare the oral lesions in HIV-seropositive patients between those who are newly diagnosed and those actively undergoing HAART and to determine the therapeutic effects of HAART on oral lesions in HIV-seropositive patients.

MATERIALS AND METHODS

The screening was done among the patients attending the VCTC Centre at Mahatma Gandhi Memorial Government hospital, Tiruchirappalli. The screening was conducted on 240 patients both male and females of age group between 25 and 40 who were confirmed with HIV-positive status with CD4 count <200 cells/mm³ were selected for the study. Out of these, 136 patients were already under HAART for the last 3 months and the rest 104 patients were newly diagnosed as HIV positive, yet the treatment to be started. Their HIV status was confirmed by western blot. CD4+ T-lymphocyte counts were assessed by flow cytometry. The study was approved by the Institutional Review Board and all the participants provided with voluntary informed consent. All potential risks and benefits were explained to all the subjects in a language that they could comprehend. Demographic data were collected using a standard questionnaire. Present medical status, past medical history, family history, and drug history were recorded. Findings were recorded using internationally accepted presumptive clinical criteria of erythematous candidiasis (European Community)-clearing house (1991-1993) on oral problems related to HIV infection and WHO collaborating center on oral manifestations of the immunodeficiency virus.⁴ Oral examination was performed which included examining the individuals for lesions such as oral candidiasis, periodontitis, hyperpigmentation,

aphthous, and herpes simplex ulcers. HAART consisted of the combination of two nucleoside reverse transcriptase inhibitors (NRTI's) (lamivudine + stavudine or lamivudine + zidovudine) and a non-NRTI (nevirapine or efavirenz). An intra-oral examination was performed clinically. Intra-orally the gingiva, periodontium, alveolar mucosa, buccal mucosa, lips, vestibule, dorsal, ventral, and lateral surfaces of the tongue and floor of the mouth were examined thoroughly. The results were tabulated in a standard form, and they were statistically analyzed using Chi-square test.

RESULTS

Out of 240 patients, 130 (54.16%) were males and 110 (45.83%) were females. When the age groups of the patients were compiled, the majority of patients were in the 25-40 (74%) years age group with the mean age of all the subjects being 34 years.

The distribution and comparison of oral lesions in individuals newly diagnosed with HAART were as follows. The occurrence of periodontal lesions was the most predominant (68.26%), followed by oral candidiasis (27.8%), hyperpigmentation (9.6%), aphthous ulcers (7.6%), and herpes (3.8%). During the intra-oral examination of individuals under active HAART, the incidence of periodontal diseases was still the most at 45%, followed by hyperpigmentation (38%), oral candidiasis (13%), aphthous ulcers (2%), and herpes (0.7%).

Thus, it was observed that the occurrence of periodontal diseases was significantly reduced in patients under HAART (68.26% newly diagnosed and 33% under HAART). Interestingly, the occurrence of hyperpigmentation was higher in patients under HAART. Before HAART therapy, only 10 patients had hyperpigmentation whereas the total number of patients under HAART observed with hyperpigmentation was 38 patients which was statistically significant. The total number of patients who presented with oral candidiasis during diagnosis were 29 (27.8%) which had reduced to 13 (11.7%) in patients under HAART. Thus, the occurrence of oral candidiasis was significantly reduced in patients undergoing HAART actively. As far as the types of oral candidiasis observed in newly diagnosed patients, 14 patients exhibited erythematous candidiasis, 6 of them showed angular cheilitis, pseudomembranous candidiasis and chronic hyperplastic candidiasis were seen in 5 and 4 patients, respectively. During the examination of patients who are actively undergoing HAART, a number of patients exhibiting erythematous candidiasis reduced to 9, angular cheilitis to 1, whereas 2 patients had pseudomembranous candidiasis and only one patient exhibited chronic hyperplastic candidiasis (Tables 1 and 2).

Table 1: Oral lesions in patients newly diagnosed with HIV and those under HAART

Oral lesions	Newly diagnosed HIV patients (n=104) (%)	Patients under HAART (n=136) (%)	P value
Periodontal lesions	71 (68.26)	45 (33)	0.0001*
Oral candidiasis	29 (27.8)	13 (11.7)	0.0002*
Hyperpigmentation	10 (9.6)	38 (27.9)	0.00028*
Aphthous ulcer	8 (7.6)	2 (1.4)	0.019*
Herpes	4 (3.8)	1 (0.7)	0.1127

*Statistically significant. HIV: Human immunodeficiency virus, HAART: Highly active antiretroviral therapy

Table 2: The types of candidiasis in patients newly diagnosed with HIV and those who are actively under HAART

Oral lesions	Newly diagnosed HIV patients (n)	Patients under HAART (n)
Erythematous candidiasis	14	9
Angular cheilitis	6	1
Pseudomembranous candidiasis	5	2
Chronic hyperplastic candidiasis	4	1

HIV: Human immunodeficiency virus, HAART: Highly active antiretroviral therapy

DISCUSSION

HIV infection results in AIDS, which is a major global pandemic infectious disease. Some specific, common oral manifestations in HIV infection were found in association with immune suppression.¹ This study is unique since it covers oral manifestations of HIV patients who are newly diagnosed and those who are actively under HAART since such a study in India is sparse.

AIDS is a chronic progressive disease characterized by immunodeficiency that is the result of HIV attacking the host CD4+ T-lymphocytes. It is generally thought that immunodeficiency is the main cause for susceptibility to various opportunistic infections in HIV and AIDS patients.¹⁶ It is generally accepted that the recognition of some oral manifestations of HIV disease is of great significance because they may represent the first sign of the disease, and they have been shown to be highly predictive markers of severe immune suppression and disease progression.

The oral lesions are often characteristic and in the majority of cases can be diagnosed by their clinical features alone.¹⁷ A review of literature shows that the reports of oral lesions from developing countries are few when compared with those from the developed nations.¹⁷ With the emergence of the antiretroviral combination therapy and prophylactic treatment, a change in the epidemiology of the opportunistic infections has occurred.¹⁸ All these effects

synergistically improve the CD4+ count and thus improve the immune status of the patient. This improved immune activity of the patients with HIV under HAART might reduce the risk of opportunistic infections such as oral candidiasis. An important observation that was made by us in this study was the presence of intraoral pigmentation in patients undergoing HAART. A statistically increased pigmentation was noted in patients under HAART. This result is concurrent with the studies made by Umadevi *et al.*¹⁹ This finding could be due to increased α -melanocyte stimulating hormone as a result of systemic ketoconazole and zidovudine therapy. This might also be due to the deregulation of the cytokines in HIV or due to certain melanocyte stimulating drugs or use of antivirals, antifungals or due to Addison's disease.²⁰

The oral manifestations of HIV infection have changed after the advent of HAART in 1995. Many opportunistic infections and neoplasms have resolved or fail to occur as a result of an improved immune system. According to our study, the prevalence of oral candidiasis and periodontal disease were less in patients who had access to HAART though there was a risk of oral hyperpigmentation.

CONCLUSION

Oral manifestations are common in HIV infected patients and are usually the first indicator of symptoms and disease progression. Our results showed that the number of oral manifestation decreased with HAART. Further large cross-sectional and longitudinal observational studies are required to evaluate the prevalence of oral lesions need to be done including less common manifestations.

REFERENCES

1. Bodhade AS, Ganvir SM, Hazarey VK. Oral manifestations of HIV infection and their correlation with CD4 count. *J Oral Sci* 2011;53:203-11.
2. UNAIDS Report on the Global AIDS Epidemic 2012. Global Report. Available from: http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/UNAIDS_Global_Report_2013_en.pdf. [Last accessed on 2014 Apr 15].
3. Arendorf T, Holmes H. Oral manifestations associated with human immunodeficiency virus (HIV) infection in developing countries - Are there differences from developed countries? *Oral Dis* 2000;6:133-5.
4. Murphy EL, Collier AC, Kalish LA, Assmann SF, Para MF, Flanigan TP, *et al.* Highly active antiretroviral therapy decreases mortality and morbidity in patients with advanced HIV disease. *Ann Intern Med* 2001;135:17-26.
5. Kumarasamy N, Solomon S, Chaguturu SK, Cecelia AJ, Vallabhaneni S, Flanigan TP, *et al.* The changing natural history of HIV disease: Before and after the introduction of generic antiretroviral therapy in southern India. *Clin Infect Dis* 2005;41:1525-8.
6. Shrimali L. A study of oral manifestation of HIV/AIDS. *Int J Oral Maxillofac Pathol* 2010;1:8-12.
7. Ghate MV, Mehendale SM, Mahajan BA, Yadav R, Brahme RG, Divekar AD, *et al.* Relationship between clinical conditions and CD4 counts in HIV-infected persons in Pune, Maharashtra, India. *Natl Med J*

- India 2000;13:183-7.
8. Castro KG, Ward JW, Slutsker L, Buehler JW, Jaffe HW, Berkelman R, *et al.* 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. *Clin Infect Dis* 1993;17:802-10.
 9. Greenspan JS. Sentinels and signposts: The epidemiology and significance of the oral manifestations of HIV disease. *Oral Dis* 1997;3 Suppl 1:S13-7.
 10. Kolokotronis A, Kioses V, Antoniadis D, Mandraveli K, Doutsos I, Papanayotou P. Immunologic status in patients infected with HIV with oral candidiasis and hairy leukoplakia. *Oral Surg Oral Med Oral Pathol* 1994;78:41-6.
 11. Glick M, Muzyka BC, Lurie D, Salkin LM. Oral manifestations associated with HIV-related disease as markers for immune suppression and AIDS. *Oral Surg Oral Med Oral Pathol* 1994;77:344-9.
 12. Gaurav S, Keerthilatha PM, Archana N. Prevalence of oral manifestations and their association with CD4/CD8 Ratio and HIV viral load in South India. *Int J Dent* 2011;2011:964278.
 13. Begg MD, Panageas KS, Mitchell-Lewis D, Bucklan RS, Phelan JA, Lamster IB. Oral lesions as markers of severe immunosuppression in HIV-infected homosexual men and injection drug users. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996;82:276-83.
 14. Greenspan D, Komaroff E, Redford M, Phelan JA, Navazesh M, Alves ME, *et al.* Oral mucosal lesions and HIV viral load in the Women's Interagency HIV Study (WIHS). *J Acquir Immune Defic Syndr* 2000;25:44-50.
 15. Kerdpon D, Pongsiriwet S, Pangsomboon K, Iamaroon A, Kampoo K, Sretrirutchai S, *et al.* Oral manifestations of HIV infection in relation to clinical and CD4 immunological status in northern and southern Thai patients. *Oral Dis* 2004;10:138-44.
 16. Liu X, Liu H, Guo Z, Luan W. Association of asymptomatic oral candidal carriage, oral candidiasis and CD4 lymphocyte count in HIV-positive patients in China. *Oral Dis* 2006;12:41-4.
 17. Ranganathan K, Reddy BV, Kumarasamy N, Solomon S, Viswanathan R, Johnson NW. Oral lesions and conditions associated with human immunodeficiency virus infection in 300 south Indian patients. *Oral Dis* 2000;6:152-7.
 18. Ranganathan K, Geethalakshmi E, Krishna Mohan Rao U, Vidya KM, Kumarasamy N, Solomon S. Orofacial and systemic manifestations in 212 paediatric HIV patients from Chennai, South India. *Int J Paediatr Dent* 2010;20:276-82.
 19. Umadevi KM, Ranganathan K, Pavithra S, Hemalatha R, Saraswathi TR, Kumarasamy N, *et al.* Oral lesions among persons with HIV disease with and without highly active antiretroviral therapy in southern India. *J Oral Pathol Med* 2007;36:136-41.
 20. Langford A, Pohle HD, Gelderblom H, Zhang X, Reichart PA. Oral hyperpigmentation in HIV-infected patients. *Oral Surg Oral Med Oral Pathol* 1989;67:301-7.

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