

COMPARISON OF ORAL LESIONS IN HIV PATIENTS WITH AND WITHOUT HIGHLY ACTIVE ANTIRETROVIRAL THERAPY VISITING GOVERNMENT HOSPITALS IN BENGALURU CITY

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ABSTRACT

BACKGROUND

The aim of the study is to assess and compare the oral lesions in HIV patients with and without Highly Active Antiretroviral Therapy (HAART) visiting the government hospitals in Bangalore city.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted among 1200 HIV patients of whom 600 each belonged to with HAART and without HAART group at the OPD of ART Centres of Government Hospitals in Bengaluru City. Information regarding patient's demographic profile, past medical history, oral hygiene practice and personal habits were obtained using a prepared proforma. Clinical examination was carried out using WHO 1997 proforma. The data was subjected to statistical analysis.

RESULTS

There was a difference in the occurrence of oral candidiasis between with HAART (5.3%) and without HAART patients (22.7%) ($p < 0.05$). The occurrence of leukoplakia between with HAART (1.8%) and without HAART patients (7.8%) ($p < 0.05$). Among HIV patients with HAART the prevalence of oral candidiasis was high (20 (3.2%)) when CD4+ count was < 200 cells/mm³ and leukoplakia was high (7 (1.2%)) in CD4+ count of 200-500 cells/mm³. Among patients without HAART, the findings of oral lesions was more when CD4+ count was < 200 cells/mm³.

CONCLUSION

The study shows that oral candidiasis and leukoplakia was less among patients with HAART when compared to without HAART therapy and they experience a decrease in the number of opportunistic infections. Oral manifestations of HIV infection might serve as good markers for monitoring, not only restoration of immune function, but also HAART failure. It is important that all healthcare workers receive education and training on the importance of oral health needs and the use of oral lesions as surrogate markers in HIV infection.

KEYWORDS

HIV Infection, Oral Lesions, Highly Active Antiretroviral Therapy.

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BACKGROUND

HIV infection is a major global health problem affecting developing and developed countries alike.¹ Recognised as an emerging disease only in the early 1980s, AIDS has rapidly established itself throughout the world and is likely to endure and persist well into the 21st century.²

HIV infection affects residents of all countries of the world, but majority of affected individuals reside in the developing countries. Because of its effect on immune system, HIV is a disease that affects every aspect of

health. One of the earliest findings is the development of oral lesions, which is a frequent problem among HIV infected patients. Various research works showed that people who are seropositive for HIV develop oral lesions and that more than 90% of HIV patients will have at least one oral manifestation.

Oral manifestations of HIV include oral candidiasis, oral hairy leukoplakia, HIV-related salivary gland enlargement, xerostomia, necrotising ulcerative gingivitis and periodontitis, necrotising stomatitis, viral infections, neoplasms, etc.³

The use of Highly Active Antiretroviral Therapy (HAART) that reduces severity of HIV is responsible for increased survival and quality of life of HIV positive individuals. Various research works showed that people who began using HAART early in the course of their disease did show better oral health. In some individuals, HAART has its own adverse effects on the oral health-like drug-induced ulcerations, xerostomia, oral mucosal pigmentation, etc. Oral manifestations of HIV infection might serve as good

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markers for monitoring not only restoration of immune function (along with the numerical parameters of viral load and CD4+ counts), but also HAART failure.⁴

Sometimes, it has been observed that on account of the social stigma attached, HIV patients are not prepared to present themselves to the dentists for treatment and also refusal of dental professionals to treat these patients. All these factors results in larger percentage of HIV patients having untreated oral conditions resulting in discomfort and disability and deterioration of the health of the oral structure.⁵

Thus, this study was undertaken to compare the oral lesions of HIV patients with and without highly active antiretroviral therapy in Bengaluru City of India.

MATERIALS AND METHODS

A cross-sectional study was conducted at the OPDs of ART centres to compare oral lesions in HIV patients with and

without highly active antiretroviral therapy at government hospitals in Bengaluru City. The clinical oral examination was carried out under natural light with mouth mirror, probe and was recorded in "WHO oral health assessment 1997 proforma."

Necessary ethical clearance and informed consent was obtained. A pilot study was conducted to assess the feasibility, validity of the proforma and to decide the sample size. Based on the results of the pilot study, a total sample size of 1200 was decided (600HIV patients with HAART; 600 HIV patients without HAART).

Statistical Analysis

The statistical software SPSS 14.0 version was used for the analysis of the data. Significance is assessed at 5% level of significance. Student’s t-test (two-tailed, independent) and Chi-square/Fisher Exact test has been used to find the significance of study parameters.

RESULTS

	HIV Patients with HAART (N=600)	HIV Patients with HAART (N=600)	P value
Gender (%)			
Male	291 (48.5%)	285 (47.5%)	
Female	308 (51.3%)	313 (52.2%)	
Transgender	1 (0.2%)	2 (0.3%)	
Age (Years)	(15-65years)	(15-65years)	
Mean age	37.44±8.67	37±8.71	
Socioeconomic Status * (%)			
Upper	3 (0.5%)	3 (0.5%)	
Upper middle	13 (2.2%)	17 (2.8%)	
Lower middle	82 (13.7%)	85 (14.2%)	
Upper lower	465 (77.4%)	479 (79.8%)	
Lower	37 (2.2%)	16 (2.7%)	
Clinical Staging # (%)			
Stage I	434 (72.4%)	374 (62.3%)	
Stage II	110 (18.3%)	138 (23.0%)	
Stage III	21 (3.5%)	45 (7.5%)	
Stage IV	35 (5.8%)	43 (7.2%)	
CD4+CellCounts (cells/cumm) (%)			
<200	126 (21.0%)	314 (52.3%)	P<0.001
200-500	355 (59.2%)	265 (44.2%)	
>500	119	21 (3.5%)	
Mode of Transmission (Both Groups) (%)			
Sexual	934 (77.8%)		
Mother to child	5 (0.4%)		
Blood transfusions	30 (2.5%)		
Injections	37 (3.1%)		
Unknown	194 (16.2%)		

Habits			
	Smoking (%)		
	Yes	40 (6.7%)	65 (10.8)
	No	560 (93.3%)	535 (89.2)
	Pan/Gutkha chewing (%)		
	Yes	70 (11.7%)	59 (9.8)
	No	530 (88.3%)	541 (90.2)
	Alcohol (%)		
	Yes	22 (3.7)	18 (3.0)
	No	578 (96.3)	582 (97.0)
	Toothbrushing habits (%)		
	1xday	572 (95.3)	565 (94.2)
	2xdays	28 (4.7)	35 (5.8)

Table 1. Demographic and Epidemiological Characteristics of HIV Patients With HAART and Without HAART

*Kuppuswamy’s Socioeconomic Status Scale-Updating for 2010, based on education, occupation and income of the family.

#WHO clinical staging system for HIV infection and HIV-related disease in adults (13 years or older).

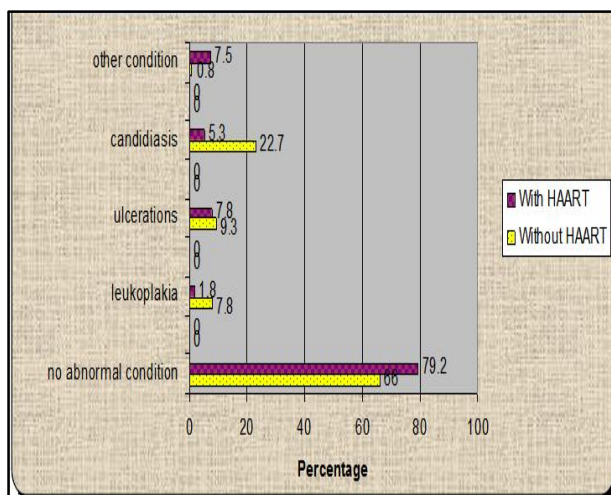


Figure 1. Distribution of HIV Patients According to Oral Mucosal Lesions

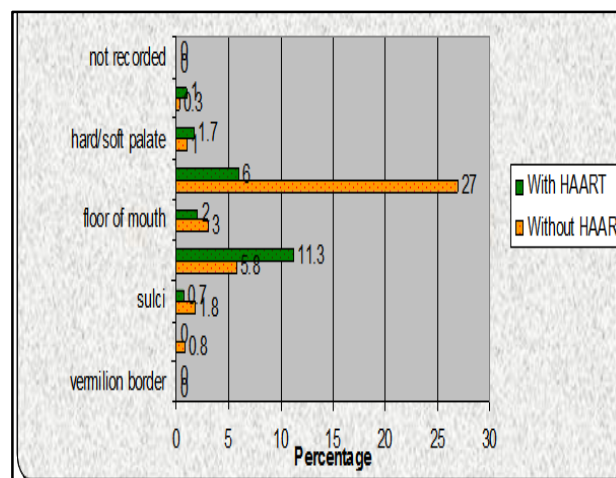


Figure 3. Distribution of HIV Patients According to Location of Oral Mucosal Lesions

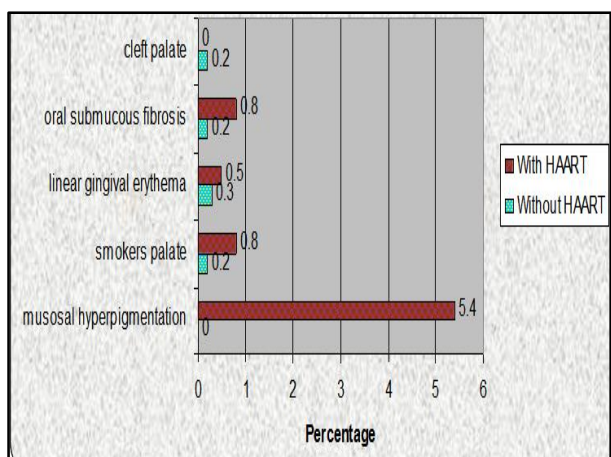


Figure 2. Distribution of HIV Patients According to Other Conditions in Oral Mucosa

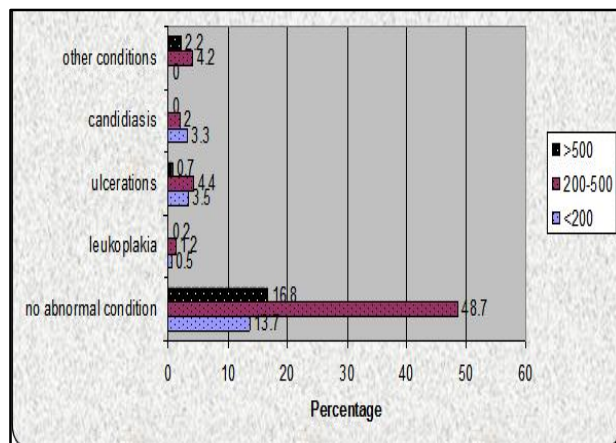


Figure 4. Distribution of Oral Lesion by CD4+ Cell Count in HIV Patients with HAART

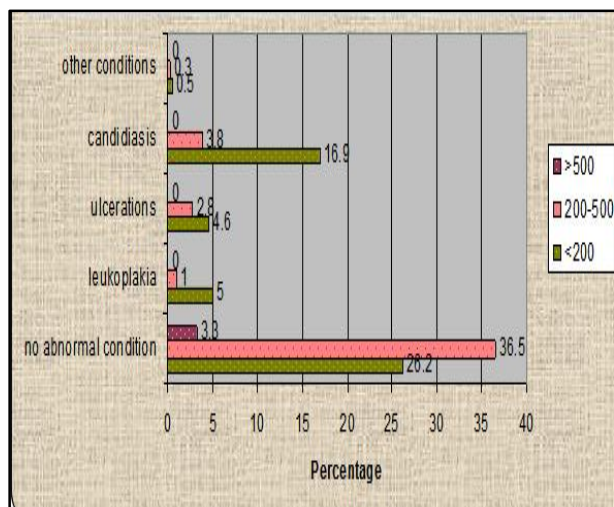


Figure 5. Distribution of Oral Lesions by CD4+Count in HIV Patients without HAART

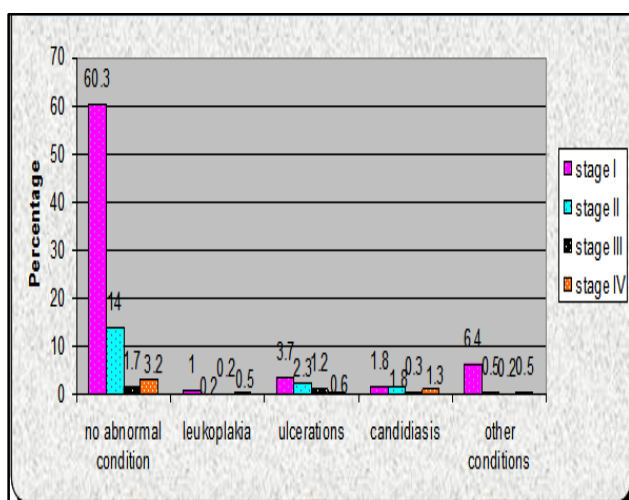


Figure 6. Distribution of Oral Lesions Based on Clinical Staging in HIV Patients with HAART

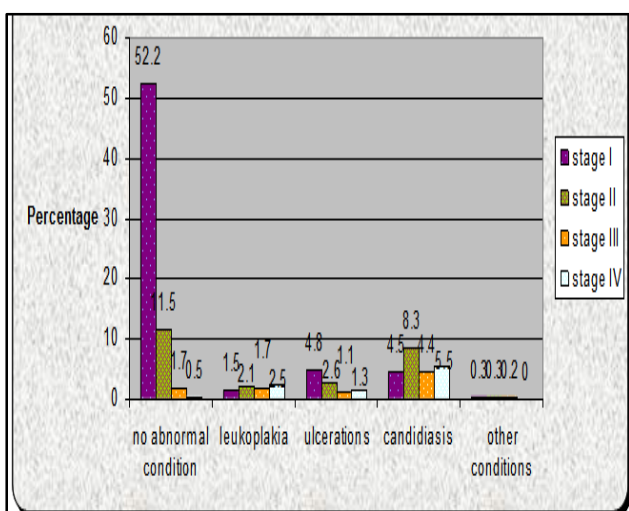


Figure 7. Distribution of Oral Lesions Based on Clinical Staging in HIV Patients without HAART

Distribution of HIV Patients According to Oral Mucosal Conditions

In this study, among HIV patients with HAART, 475 (79.2%) of the patients had no abnormal condition, while 47 (7.8%) of them presented with oral ulcerations

(aphthous, herpetic, traumatic), while 45 (7.5%) had other conditions like drug-induced melanosis, smokers palate, linear gingival erythema and oral submucous fibrosis, 32 (5.3%) of them had oral candidiasis and 11 (1.8%) had leukoplakia.

Among HIV patients without HAART, 396 (66.0%) had no abnormal condition, followed by 136 (22.7%) with oral candidiasis, 56 (9.3%) of the patients with ulcerations (aphthous, herpetic, traumatic), 47 (7.8%) had leukoplakia and 5 (0.8%) had other conditions like drug-induced melanosis, smokers palate, linear gingival erythema, oral submucous fibrosis and cleft palate (Figure 1).

Distribution of HIV Patients According to Other Conditions in Oral Mucosa

The other oral mucosal conditions included hyperpigmentation, smoker’s palate, linear gingival erythema, oral submucous fibrosis and cleft palate in HIV patients.

In HIV patients with HAART, out of a total of 45 patients, 32 (5.4%) had mucosal hyperpigmentation followed by 5 (0.8%) with smokers palate and oral submucous fibrosis and 3 (0.5%) of the patients had linear gingival erythema.

Among HIV patients without HAART, out of 5 patients, 2 (0.3%) of the patients has linear gingival erythema, while 1 (0.2%) had smokers palate, oral submucous fibrosis and cleft palate. None of them had mucosal hyperpigmentation (Figure 2).

Distribution of Oral Lesions by CD4+Count in HIV Patients with HAART and Without HAART

The association between oral lesions with CD4+ cell count and clinical staging of disease among both the groups in patients was found to be statistically significant (P<0.001) (Figure 3, 4, 5, 6 and 7).

DISCUSSION

Oral manifestations of HIV infection are a fundamental component of disease progression and occur in approximately 30-80 percent of the affected patient population. Factors which predispose expression of oral lesions include CD4 counts less than 200 cells/cu mm, viral load greater than 3000 copies/mL, xerostomia, poor oral hygiene and smoking. Oral lesions are differentiated as fungal, viral and bacterial infections, neoplasms such as Kaposi’s sarcoma and nonspecific presentations such as aphthous ulceration and salivary gland disease.⁶

Majority (72.4%) of HIV patients with HAART belonged to clinical stage I, whereas a study by Omar Hamza et al⁷ reported 70% of patients in stage II to III. 62.3% of HIV patients without HAART belonged to stage I, which is contrary to a study by MA Adedigba et al⁸ where two-thirds (59.1%) were in stage III and 10.2% were in stage I.

Among HIV patients with HAART, majority of the patients (59.2%) had CD4+ cell count between 200-500 cells, which is similar to findings by A Kroid et al,⁹ D Eyeson et al¹⁰ in patients where majority had CD4+

>200cells/mm³, but was found contrary to a study by Omar Hamza et al⁷ where majority (67.8%) had CD4+ count <200 cells/mm³. Among HIV patients without HAART, majority of the patients (52.3%) had CD4+ cell count <200cells/mm³, which is almost similar to findings by Omar Hamza et al⁷ (51.3%), MI Mattee et al¹¹ (52%), but less when compared to J Campo et al¹² (12.2%).

CD4+ cell count <200 cells/mm³ was high (52.3%) among HIV patients without HAART compared to with HAART group with (21.0%), which is contrary to study by Umadevi et al¹³ where majority of the patients in with and with HAART had >200 CD4+ cell count.

The most common mode of transmission among both the groups was sexual (77.8). Overall, the present study is similar to other studies by Ines Maria Bravo et al,¹⁴ Umadevi et al,¹³ MA Adedigba et al,⁸ C Bendick et al,¹⁵ D Eyeson et al,¹² Harminder Singh et al,¹⁶ J Campo et al¹² where the most frequent mode of transmission was sexual, but a study by Dunic et al¹⁷ reported that intravenous drug users constituted the majority.

Among the oral mucosal conditions, majority (66.0%) in without HAART and (79.2%) in with HAART patients had no abnormal condition. This could be due to the fact that patients were on therapy in with HAART group, which reduced the prevalence of lesions.

In this study, leukoplakia (7.8%), ulcerations (9.3%), candidiasis (22.7%) was more in without HAART patients when compared to with HAART patients with leukoplakia (1.8%), ulcerations (7.8%) and candidiasis (5.3%), which is similar to a study by Umadevi et al.¹³

In with HAART patients, the prevalence of candidiasis in the present study is more compared to Carlos Lima et al³ (3.9%), but lower compared to studies by Omar Hamza et al⁷ (24.7%), A Kroid et al⁹ (7.2%), Umadevi et al¹³ (12%) and Dunic et al¹⁷ (77.7%). The prevalence of leukoplakia in the present study is less compared to studies by Margiotta et al⁵ (9.6%), D Eyeson et al¹⁰ (9.9%), A Kroid et al⁹ (3.6%) and Umadevi et al¹³ found 0% prevalence in this group. The prevalence of ulcerations in the present study is found to be less when compared to D Eyeson et al¹⁰ (22.7%), but more when compared to A Kroid et al⁹ (1.4%), Margiotta et al⁵ (3.8%) and Ranganathan K et al¹⁸ (2000) (3%). However, Umadevi et al¹³ in their study did not report any ulcers in patients with HAART.

In without HAART patients, the prevalence of candidiasis in the present study is less when compared to studies by Umadevi et al¹³ (42%), MA Adedigba et al⁸ (72.9%), Dunic et al¹⁷ (77.3%) and Campo J et al¹² (37.8%). The prevalence of leukoplakia in present study is almost similar to Umadevi et al¹³ (2%), but less when compared to C Bendick et al¹⁵ (45.5%).

However, in a review of oral lesions by K Ranganathan et al (2006) in developing countries reported that in India the frequency of oral candidiasis was around 21-81% and oral hairy leukoplakia 2-7%, which is almost similar to the present study.

The prevalence of mucosal hyperpigmentation was higher among patients with HAART (5.4%), which is similar

to study by Umadevi et al,¹³ Omar Hamza et al⁷ (5.2%), Margiotta et al⁵ (6.7%), Ranganathan K et al¹⁸ (23%) and A Kroid et al⁹ (1.4%).

Ranganathan K et al¹⁸ has reported oral submucous fibrosis in 2% of HIV patients and another study by the same author in 2004 has reported a 0.9% prevalence of oral submucous fibrosis.

The prevalence of smokers palate and oral submucous fibrosis was high 5 (0.8%) in patients with HAART group. Oral submucous fibrosis reported in the present study was due to the habit of arecanut chewing, but it is not clear whether the frequency of OSMF is actually raised with HIV infection.

Linear gingival erythema was 0.3% in patients without HAART and 0.5% in with HAART group, which is lower compared to other studies by A Kroid et al⁹(9.4%) and C Bendick et al¹⁵ (11.9%). However, K Ranganathan et al in a review on oral lesions in developing countries have reported linear gingival erythema with frequencies ranging from 2-6%, which is more compared to this study.

Among HIV patients with HAART, the prevalence of oral candidiasis was high (3.3%) when CD4+ count was <200cells/cu mm³ and none was seen in CD4+ count above 500 cells/mm³, which is similar to findings in a study by Carlos Lima et al,³ D Eyeson et al,¹⁰ A Kroid et al,⁹ but contrary to findings in a study by Umadevi et al¹³ where the prevalence of oral candidiasis was high when CD4+ was >200 cells and low in CD4+ <=200 cells.

However, leukoplakia was higher (1.2%) in CD4+ count of 200-500 cells/mm³, which is contrary to studies by A Kroid et al⁹ and D Eyeson et al¹⁰ where it was found to be higher when CD4+ count was <200 cells/mm³.

The prevalence of oral lesions was more when CD4+ count was <200cells/cu mm decreased in as the cell count increased. The prevalence of leukoplakia, ulcerations, oral candidiasis and other conditions was 5.0%, 4.6%, 16.9% and 0.5%, respectively when CD4+ count was <200cells/mm³, which is similar to a study by Kolokotronis et al¹⁹ and Umadevi et al¹³ who showed that oral candidiasis was more with CD4+ <200 cells in HIV patients and reduced as the count increased.

Overall, a study by Tappuni et al²⁰ reported that oral manifestations significantly increased with CD4 counts <200 cells/mm³, which is similar to the present study.

The improvement of the immune system in patients receiving HAART may explain the reduction in the prevalence of this opportunistic infection.

Among HIV patients with HAART, the prevalence of leukoplakia 6 (1.0%) and ulcerations 22 (3.7%), oral candidiasis 11 (1.8%) was higher in clinical stage I. The prevalence of other conditions was higher in clinical staging I 38 (6.4%), while it was 3 (0.5%) in clinical staging II and IV and was 1 (0.2%) in clinical staging III, respectively and highly significant clinical staging differences were observed with respect to prevalence of oral lesions (P<0.001).

SUMMARY AND CONCLUSION

HIV disease in India has a diverse range of manifestations in multiple organ systems including oral cavity. Oral disease represents an important health problem for HIV infected individuals, because of its diagnostic, prognostic and therapeutic implications. Hence, in an attempt to understand this aspect, the present study was carried out.

Early detection of HIV optimises chemoprophylaxis for opportunistic infections and provides an opportunity for secondary HIV prevention. In addition, the availability of HAART can vastly reduce morbidity and mortality in Indian patients. In India, generic HAART has been shown to be safe, well tolerated and effective at increasing CD4+ counts. Hence, it can be concluded that patients on HAART are experiencing a decrease in the number of opportunistic infections.

RECOMMENDATIONS

The dental treatment and management of HIV infected patients can be characterised by five major concerns- Infection control; recognition, diagnosis and management of oral manifestations; systemic ramification; ethical and legal issues; and psychological aspect.

- The emphasis has to be laid down to protect the patient and the dental team from contracting infection during dental procedures by implementing universal precaution to prevent cross infection.
- Exotic diseases that in the past were of exclusive academic interest are now observed frequently in patients with this condition. The dentist must increase his or her expertise in this field and relies on other support provided by oral biopsy and laboratory aids. Improved understanding and recognition of the clinical spectrum of these oral mucosal lesions will lead to improved patient care and a better knowledge.
- In general, there is no justification to modify dental treatment based solely on patient's HIV status alone. Consideration should be given to patient's use of an antibacterial mouth rinse, such as chlorhexidine gluconate prior to therapy to reduce intraoral bacterial load.
- Decreased salivary flow increases the incidence of caries and local factors (plaque and calculus) including subgingival bacteria or Candida maybe partially responsible for the more rapid periodontal disease observed in HIV infected patients. Hence, instructing the patients for maintaining good oral hygiene is important to reduce potential oral complications. Along with this, institution of daily antibacterial mouth rinses, fluoride supplements (mouth rinses and topical fluoride) will be very much helpful.
- The dental healthcare team is faced with two major psychosocial aspects, psychosocial effect of the disease on the patients and the psychosocial effect on the healthcare provider.
- Patients may experience periods of denial, fear, anger, disbelief, guilt and anxiety about death during the progression of their disease, which can directly influence the patient-dentist relationship and also as observed in the present study, the number of patients visiting the dentist after diagnosis is very much less, though many of the patients were having dental problems and discomfort due to oral manifestation of HIV disease.
- Hence, in this connection, the dentists and the entire team of healthcare providers need to understand the psychological aspect of the patient and his family to have better understanding and relationship between the dentist and the patient.
- As healthcare providers, dentists need to be well-versed in counseling and educating patients about HIV transmission and in particular ways for prevention. They need to have very friendly atmosphere and confidentiality has to be maintained, so that it is possible for the patients to be able to openly discuss about their sexual practices, habits and social norms.
- For the healthcare providers, it is important to have a current knowledge and understanding about the transmission of HIV infection. This will help them to manage and overcome the pressure from peer groups and family members to avoid treating HIV infected patients. Moreover, the number of asymptomatic HIV patients are increasing and hence better understanding and management of these patients are utmost important.
- Hence, matters that need to be addressed to the healthcare providers are HIV pathogenesis, transmission, epidemiology, oral and systemic manifestations, legal and ethical issues and psychological considerations. Regular training sessions need to be instituted through continuing medical and dental education programmes for updating information. These sessions should also address concerns and issues that have arisen during the treatment of HIV infected patients. Dentists need to encourage patients to disclose their HIV status for diagnostic and clinical management purpose.
- There is a need for longitudinal studies to ascertain the role of oral lesions as markers of immune failure in patients with HIV/AIDS undergoing HAART in a resource-constrained setting such as India.

However, there is no single solution to the problem of HIV/AIDS in the developing world, because it is not a single place with uniform needs. Each country presents its own mixture of challenges and opportunities, so also they have varying levels of medical infrastructures to make treatment for HIV infection feasible and few if any have the economic ability to deliver treatment and care to all who need it.

Making public health advances in developing world including India where majority of HIV patients live a long-

term commitment to comprehensive healthcare solutions are needed utmost. Along with these measures, drugs, supportive care, diagnostics, side effects management, sanitation and basic nutrition are of important consideration.

The united activity of all the organisations such as United Nations, the Governments and NGOs, interested and involved activist organisations, international relief agencies and major sources of private funding are needed for the effective management and control of HIV/AIDS.

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