

EXPLORING THE IGNORED- THE ORAL HYGIENE STATUS AMONG HUMAN IMMUNODEFICIENCY VIRUS INFECTED ADULT PATIENTS ON ANTI RETROVIRAL THERAPY, IN RAICHUR TALUK, KARNATAKA, INDIA

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ABSTRACT

Introduction: Very few studies in the world have been related to the oral hygiene status and the oral hygiene practices of the HIV positive patients. The present study was thus aimed to contribute to the oral health research of the HIV positive adult patients on Anti Retroviral Therapy for more than a year, in Raichur taluk, Karnataka, with respect to their oral hygiene status. **Aim and Objectives:** To assess the oral hygiene status of the HIV positive patients in Raichur taluk, Karnataka, India, on Anti Retroviral Therapy for more than one year; To assess their oral hygiene practices; To assess the correlation between the oral hygiene practices, age, CD4 count, duration of HIV and Anti Retroviral Therapy with the oral hygiene status. **Material and Methods:** A cross-sectional study was carried out among 169 HIV positive patients on Anti Retroviral Therapy for more than one year, in Raichur taluk, Karnataka, India. Convenient sampling was used. The Oral Hygiene Index-Simplified was used to evaluate their oral hygiene status. Data was analysed using SPSS 16.0 software. **Results:** Fifty seven patients (33.7%) had a good oral hygiene, 86(50.9%) had a fair oral hygiene and 26(15.4%) had a poor oral hygiene. Higher percentage of illiterate patients had a poor oral hygiene compared to the literate and this difference was statistically significant ($p=0.03$). **Conclusion:** The present study thus recommends for the importance of oral health education and intervention programmes for the HIV positive patients to improve their oral hygiene status.

KEYWORDS: HIV, Antiretroviral therapy, Oral Hygiene Index, Oral Hygiene Status

INTRODUCTION

Human Immunodeficiency Virus infection (HIV) /Acquired Immune Deficiency Syndrome (AIDS) is considered as a devastating global health problem posing severe challenges in low and middle income countries. The continuous increase in number of People Living With HIV/AIDS (PLWHA) represents a serious health and economic burden that the world is facing.^[1] The United Nations Programme on AIDS (UNAIDS) estimates that there are 33.4 millions who are suffering from HIV in the world all over. This is 20% more than what it was for the year 2001. In the year 2011-2012, 1.67 lakhs cases of HIV were identified in India.^[2] HIV even today is seen as a social stigma. There are a lot of challenges that the people suffering from HIV have to face. It is easy to enumerate them but difficult to be actually be in their shoes. These individuals irrespective of their background or the people among whom they stay are subjected to a number of psychological stresses and in turn tend to neglect their already compromised health. Steward and associates suggest that, by challenging HIV-positive individuals' own hostile attitudes toward the disease, it may be possible to improve their overall psychological health.^[3] People fear that they might be ostracized from the society if their infection status is revealed.^[4] This adds to the existing debilitating state of these patients. HIV prevention must be a multidisciplinary approach involving physicians, dentists, pharmacists, nurses, health educators, therapists and other health care providers.^[5] According to the National AIDS Control Organization, there are six high prevalent states- Karnataka, Maharashtra, Goa,

Table 1: Distribution of HIV positive patients based upon their Haemoglobin count

Haemoglobin count (mg/dl)	n	%
3.5-6.0	03	1.8
6.1-9.0	24	14.2
9.1-12.0	100	59.2
>12.0	42	24.8
Total	169	100.0

Table 2: Association of age and oral hygiene status

Age groups(years)	Oral hygiene status						Total	
	Good		Fair		Poor		n	%
<20	3	75.0	1	25.0	0	0.0	4	100
20-29	15	55.6	10	37.0	2	7.4	27	100
30-39	25	36.8	34	50.0	9	13.2	68	100
40-49	14	24.1	34	58.6	10	17.3	58	100
50-59	0	0.0	7	63.6	4	36.4	11	100
≥60	0	0.0	0	0.0	1	100	1	100
Total	57	33.7	86	50.9	26	15.4	169	100

$\chi^2=14.34, df=4, p=0.006$

Table 3: Association between type of cleaning and the oral hygiene status

Type of cleaning	Oral hygiene status						Total	
	Good		Fair		Poor		n	%
Toothbrush	45	38.8	57	49.1	14	12.1	116	100
Finger	9	21.4	22	52.4	11	26.2	42	100
Neem stick	3	27.3	7	63.6	1	9.1	11	100
Total	57	33.7	86	50.9	26	15.4	169	100

$\chi^2=4.97, df=2, p=0.08$

Table 4: Association of material used to clean the teeth and oral hygiene status

Material used	Oral hygiene status						Total	
	Good		Fair		Poor		n	%
None	3	25.0	8	66.7	1	8.3	12	100
Toothpaste	46	38.3	60	50.0	14	11.7	120	100
Tooth powder	0	0.0	2	40.0	3	60.0	5	100
Charcoal	8	25.0	16	50.0	8	25.0	32	100
Total	57	33.7	86	50.9	26	15.4	169	100

$\chi^2=7.63, df=2, p=0.022$

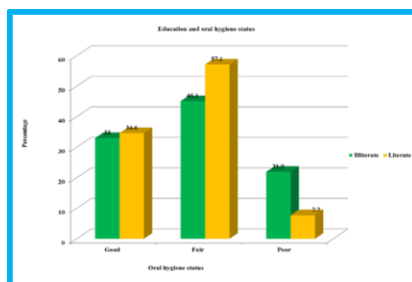


Fig. 1: Distribution of the HIV positive patients based upon the education and oral prevalent states- Karnataka, Maharashtra, Goa, Andhra Pradesh, Tamil Nadu and Kerala and 76% of People Living With HIV/AIDS (PLWHA) belong to these states.^[6] People with low income, have the most limited access to education, prevention and treatment of any form of

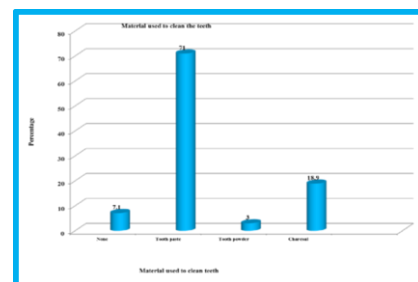


Fig. 2: Distribution of the HIV positive patients based upon the material used to clean their teeth disease.^[7] The oral cavity is an important and frequently undervalued source of diagnostic and prognostic information in patients with HIV disease. The nature of HIV/AIDS has changed from an acute disease to a chronic disease after introduction of Highly Active Anti Retroviral

Therapy (HAART) in developed countries. However, in countries where HIV/AIDS is widespread and HAART medications are too expensive or patients are failing HAART, oral disease management and risk remains an important issue.^[8] A variety of conditions affecting oral mucosal tissues may arise either *de novo* or secondary to lesions elsewhere in the body and may provide the genitourinary physician with additional knowledge of individual patients' biological responses to their HIV infection.^[9] Oral lesions that are strongly associated with HIV infections included oral candidiasis, hairy leukoplakia, Kaposi sarcoma, linear gingival erythema, necrotizing ulcerative gingivitis, necrotizing ulcerative periodontitis and non-Hodgkin lymphoma.^[1,4,10-13] Majority of the studies across the world have been related to HIV and the opportunistic infections. Very few have been related to the oral hygiene status and the oral hygiene practices of the HIV positive patients. The present study was thus aimed to contribute to the oral health research of the HIV positive adult patients on Anti Retroviral Therapy for more than a year, in Raichur taluk, Karnataka, with respect to their oral hygiene status.

MATERIALS AND METHODS

The study design was cross-sectional in nature. Prior to the start of the study, ethical clearance was obtained from the institutional ethical committee of Navodaya Dental College and Hospital, Raichur, Karnataka. Permission was also obtained from the authorities of the District Civil Hospital, Raichur. Written consent was taken from each of the participant. A pilot study was carried out on 30 patients to calculate the final sample size and to find out the feasibility and applicability of the questionnaire. Convenient sampling technique was used. The oral hygiene status of the patients was evaluated using the Oral Hygiene Index- Simplified.^[14] Other data on sweet score and the oral hygiene practices of the patients were also noted. The total sample size was 169. All those adult patients on Anti Retroviral Therapy for more than a year and who have given written consent were included in the study. The data was tabulated and analysis was done using SPSS package of 16.0 and the p value of 0.05 and less was considered to be statistically significant.

RESULTS

There were 51.5% males and 48.5% females. Also 85.8% were Hindus and 14.2% were Muslims. Age range of the patients was 19-60 years. The participants mean age was 37.12 (\pm 8.21) years. One hundred and sixty four (97.0%) were married and five (3.0%) were unmarried. Ninety patients (53.3%) were positive since 1-3 years, 65 (38.4%) were positive since 3.1-6 years, 14 (8.3%) were positive since 6.1-9 years. Overall, 101 (59.8%) patients were on Anti Retroviral Therapy since 1-3 years, 56 (33.1%) patients since 3.1-6 years and 12 (7.1%) since 6.1-9 years. Forty eight (28.4%) patients had a CD4 count upto 350 or below, 101 (59.8%) had a CD4 count between 351-750 and 20 (11.8%) had a CD4 count above 750. Fifty seven patients (33.7%) had a good oral hygiene, 86 (50.9%) had a fair oral hygiene and 26 (15.4%) had a poor oral hygiene. Table 1 shows the distribution of the patients based upon their haemoglobin count. Among the 169 HIV positive patients, 42 (24.9%) were from the upper middle class, 27 (16.0%) were from the middle/lower middle class, 92 (54.4%) were from the upper lower class and 08 (4.7%) lower class. There was no association between gender ($p=0.71$), religion ($p=0.34$) and the socioeconomic status ($p=0.57$) of the patients and their oral hygiene status. Percentage of literate patients with poor oral hygiene were lesser than the illiterate patients and was statistically significant ($p=0.03$, Fig. 1). Percentage of unmarried patients with good oral hygiene was higher than the married patients ($p=0.027$). On correlating the years since the patients were HIV positive ($p=0.23$), their present CD4 count ($p=0.98$) and the duration of Anti Retroviral Therapy regime ($p=0.27$) with the oral hygiene status, no statistically significant association was found. Among the 169 HIV positive patients, 116 (68.6%) used toothbrush to clean their teeth, 42 (24.9%) used finger while 11 (6.5%) used neem stick to clean their teeth. Even though the higher percentage of poor oral hygiene was found among those cleaning their teeth with finger, no statistically significant association could be found (Table 3). One hundred and twenty (71.0%) patients used toothpaste to clean their teeth (Fig. 2). Higher percentage of patients with good oral hygiene was seen among those who changed their toothbrushes every 3 months

or earlier, compared to the rest but this was statistically not significant. Patients using toothpaste had a higher percentage of good oral hygiene compared to the rest. There was a statistically significant association between the material used to clean the teeth and the oral hygiene status of the patients ($p=0.022$, Table 4). There was no statistically significant correlation between the oral hygiene status with the time of cleaning (before and after meals) ($p=0.18$), frequency of cleaning ($p=0.81$) and the sweet score ($p=0.64$).

DISCUSSION

The present study involved 169 HIV positive adults on Anti Retroviral Therapy higher than the study in Thailand (99 patients on HAART).^[15] A similar percentage of male and female participants was observed in Thailand study.^[15] The Raichur population showed higher percentage on Anti Retroviral Therapy for less than 3 years, compared to the findings of the study in Thailand where 4.8% of the participants were on Anti Retroviral Therapy for less than 3 years and 8.8% were on Anti Retroviral Therapy for more than 3 years.^[15] Our study found lesser percentage of people with poor and fair oral hygiene and higher percentage of patients with a good oral hygiene compared to that of studies in Thailand^[15] and Brazil.^[16] Though these studies have mentioned about the status, but they did not correlate with the other parameters unlike ours. We found that as the age of the HIV positive patients increased, they had poorer oral hygiene. Also there was an association of factors like age, education, marital status and the material used for cleaning and the oral hygiene status. This could be due to the neglect of the patients towards oral health, advancing age and the debilitating physical state. There was 7.1% of the participating population that used no material to clean their teeth and 18.9% used charcoal. This further adds to the poor oral hygiene. Ours is the first kind of study to solely focus upon and correlate the different factors to the poor oral hygiene status among the HIV positive patients who are on Anti Retroviral Therapy in the world. Since Anti Retroviral Therapy drugs are known to cause salivary gland disorders, resulting in xerostomia and resulting complications, the need for an intervention is essential to maintain a good oral hygiene. Though other factors like sweet

score, frequency of cleaning the teeth and method of cleaning apart from the CD4 count and Anti Retroviral Therapy duration did not statistically correlate to the poor oral hygiene status, nevertheless, these factors cannot be overlooked for the same. At the same time it is imperative to impress upon these patients, by the health care workers in the field of HIV and AIDS, regarding not just the opportunistic infections but also the other local factors like diet intake, oral hygiene practices and oral health awareness, since the future problems that arise of these wrong practices and attitudes, could be very well avoided. The interplay of all the local factors is an important phenomenon to give rise to poor oral hygiene. The need for oral health education and primary prevention is thus again underlined with our findings. The study does have its limitations. Though oral health education and oral hygiene instructions and diet counselling was carried out for the participants overall, no follow up was done. This study opens a new window for look out where a longitudinal study can be carried out among the HIV positive population related to the effect of counselling and education on their attitudes and assist them to focus upon the oral hygiene status. Since identification and attrition of these patients in particular is challenging, training the nursing staff to perform additional duties of imparting oral health education apart from their routine, among these patients could serve the purpose.

CONCLUSION

The present study looks at a greater and a completely newer spectrum in the epidemiological studies related to HIV positive population regarding the oral hygiene status. Only a little more than a quarter of the patients had a good oral hygiene and half of them had a fair oral hygiene. Also there are factors like advancing age, material used to clean the teeth that strongly affect the oral hygiene status of the patients on Anti Retroviral Therapy. The complications of poor oral hygiene i.e. plaque accumulation, and subsequent dental and periodontal complications are avoidable with health education and awareness. Poor oral hygiene leads to dental and periodontal diseases, and are avoidable with health education and awareness.

RECOMMENDATIONS

1. Training of nursing staff and counsellors

- regarding oral health and proper brushing techniques.
2. Policies for mandatory oral health check up of the key population at risk frequently.
 3. Free or subsidized distribution of toothbrushes and toothpastes to the affected population.
 4. Encouraging a private public partnership for providing affordable non- invasive therapies for the HIV population especially for the rural and the poorer socio economic class-like oral prophylaxis and topical fluoride applications.
 5. Awareness about proper brushing and mouth rinsing through mass media.

CONFLICT OF INTEREST & SOURCE OF FUNDING

The author declares that there is no source of funding and there is no conflict of interest among all author.

BIBLIOGRAPHY

1. Khan SA, Moorthy J, Omar H, Hasan SS. People living with HIV /AIDS (PLWHA) and HIV/AIDS associated oral lesions; a study in Malaysia. *BMC Public Health*. 2012;12:850.
2. Sidibé M. UNAIDS Executive Director, Under Secretary, General of the United Nations, UNAIDS Report on the Global AIDS Epidemic. 2012;6-104.
3. Steward WT, Chandy S, Singh G, Panicker SJ, Osmand TA, Heylen E, Ekstrand ML. Depression is not an inevitable outcome of disclosure avoidance: HIV Stigma and mental health in a cohort of HIV infected individuals from Southern India. *Psychol Health Med*. 2011;16(1):74–85.
4. Anish TS, Vijaykumar K, Simi SM. Determinants of rapid progression to immunodeficiency syndrome among people infected with Human Immunodeficiency Virus, Kerala, India. *Indian J Sex Transm Dis*. 2011;32(1):23-29.
5. Azodo CC, Ehizele AO, Umoh A, Ogbemor G. Preventing HIV Transmission in Nigeria: Role of the Dentists. *Malaysian J Med Sci*. 2010;17(2):10-7.
6. Ministry of Health and Family Welfare, NACO, Department of AIDS Control. Annual report 2011- 2012:1-104.
7. Coelho KR. Challenges of the oral cancer burden in India. *Journal of Cancer Epidemiology*. 2012:1-17.
8. Chattopadhyay A, Patton LL. Smoking as a risk factor for oral candidiasis in HIV-infected adults. *J Oral Pathol Med*. 2013;42(4): 302-8.
9. Chapple ILC, Hamburger J. The significance of oral health in HIV disease. *Sex Transm Infect*. 2000;76:236-43.
10. Johnson NW. The mouth in HIV/AIDS: markers of disease status and management challenges for the dental profession. *Australian Dental Journal*. 2010;55(1):85-102.
11. Leão JC, Ribeiro CMB, Carvalho AAT, Frezzini C, Porter S. Oral complications of HIV disease. *Clinics*. 2009;64(5):459-70.
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;11-8.
13. Sen S, Mandal S, Bhattacharya S, Halder S, Bhaumik P. Oral manifestations in human immunodeficiency virus infected patients. *Indian J Dermatol*. 2010;55:116-8.
14. Greene JC, Vermillion JR. The simplified oral hygiene index. *J Amer Dent Assoc*. 1964;68:7-13.
15. Nittayananta W, Talungchit S, Jaruratanasirikul S, Silpapojakul K, Chayakul P, Nilmanat A, *et al*. Effects of long-term use of HAART on oral health status of HIV-infected subjects. *J Oral Pathol Med*. 2010;39:397-406.
16. Lemos SSS, Oliveira FA, Vencio EF. Periodontal disease and oral hygiene benefits in HIV seropositive and AIDS patients. *Med Oral Patol Oral Cir Bucal*. 2010;15(2):417-21.