Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Disease

journal homepage: www.elsevier.com/locate/apjtd

Document heading doi: 10.1016/S2222-1808(14)60578-8

Prevalence and Determinants of Chronic periodontitis in HIV positive patients in Nigeria

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PEER REVIEW

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Comments

In this is study the authors evaluated the prevalence and determinants of chronic periodontitis in HIV positive patients. And the results shows the prevalence of periodontitis, and their CD4 amongst HIV patients
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ABSTRACT

Objective: To determine the prevalence and determinants of chronic periodontitis in HIV positive patients.

Methods: A total of 120 HIV positive patients attending the dedicated HIV outpatient clinic of the Lagos University Teaching Hospital, Nigeria were recruited for the study. Their periodontal status was assessed using the community periodontal index of treatment needs. Their CD4+ cell count was determined using the flow-cytometer method. The risk factors for periodontitis including age, gender, education, smoking, CD4+ cell counts, bleeding on probing (BOP) were determined.

Results: Prevalence of periodontitis was high (63.3%) in the HIV positive patients. In a bivariate analysis, significant associations were observed between severity of periodontitis and age ≥35 years (P=0.021), male gender (P=0.005), smoking (P=0.040) and ≥3 community periodontal index of treatment needs sextants exhibiting BOP (P=0.004). In a binary logistic regression, independent predictors of periodontitis were ≥3 sextants exhibiting BOP (odds ratio 1.738, 95% CI 1.339 to 2.256, P=0.000) and age ≥35 years (odds ratio 1.057, 95% CI 1.005 to 1.111, P=0.030). The CD4+ cell counts were not associated with periodontitis in the HIV positive patients (P=0.988).

Conclusions: A high prevalence of periodontitis was found among the HIV positive Nigerian patients in this study. Older age ≥35 years and BOP were the determinants of periodontitis. There is therefore a need for close periodontal monitoring of HIV positive Nigerian patients with emphasis on preventive, professional oral prophylaxis.

KEYWORDS

Periodontitis, HIV, Community periodontal index of treatment needs, Bleeding on probing, Sextants, CD4+ count, Nigeria

1. Introduction

The human immunodeficiency virus (HIV) infection has remained a global pandemic with an estimation of 34 million people living with the infection worldwide[1]. Unfortunately, sub-Saharan Africa bears the largest burden of the HIV disease with estimated 23.5 million people living with HIV[1]. Nigeria is the most populous country in Africa, and it has the second largest population of people living with HIV infection after South-Africa with the estimated 3.4 million affected people[2]. The HIV infection causes a depletion of the CD4+ cells resulting in an impairment of immune responses. The

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Foundation Project: Supported by US President's Emergency Plan for AIDS Relief (Grant No U51HA025522. 08/21/04 - 02/28/11).

Article history:
Received 4 May 2014
Received in revised form 10 May, 2nd revised form 17 May, 3rd revised form 30 May 2014
Accepted 10 Jun 2014
Available online 15 Jun 2014

impact of the infection on affected persons could be enormous, causing numerous health challenges, including a variety of opportunistic infections such as chronic periodontitis. There is a reported higher risk of chronic periodontitis in HIV infected patients[3,4]. Although chronic periodontitis is initiated by microbial plaque, it is mainly the host immune and inflammatory response that are responsible for most of the tissue destruction that occurs[5]. The pathogenesis of periodontitis in HIV infection has been ascribed to the increased numbers of plasma cells, mast cells, macrophages and neutrophils which release preformed pro-inflammatory cytokines mediating bone loss[6,7]. Polymorphonuclear neutrophils in peripheral blood of HIV infected individuals are hyper-responsive, a consequence of lymphocyte depletion and subsequent periodontal tissue damage[8]. Pro-inflammatory cytokines including interleukin-18 (IL-18) are also involved in the pathogenesis of HIV disease. In HIV positive patients, it has been demonstrated that gingivitis and periodontitis sites with high gingival crevicular fluid levels of IL-18 are at significantly greater risk for progression of established periodontitis. In addition, patients with HIV infection and periodontitis have higher levels of IL-2 and IL-18 than HIV positive patients without periodontitis[9].

Chronic periodontitis in HIV positive individuals often progress gradually, with little or no pain, masking its presence until severe tissue destruction has occurred[10]. Various susceptibility factors may all interact to influence the host immune response[5]. Among HIV positive patients, recognized risk factors include older age[10,11], smoking[10,12,13], viral load[10], poor oral hygiene habits[12], specific microbiota such as *Prevotella intermedia* and *Aggregatibacter actinomycemcomitans*[10], and CD4+ cell counts <200/μL[11,14]. Barr *et al.* reported a higher risk for periodontal attachment loss in HIV infected subjects over 35 years of age with CD4+ lymphocyte counts <200 cells/mm^3[11]. This observation of the association of low CD4+ cell counts with chronic periodontitis in literature is equivocal. Other studies have documented lower periodontitis experience in individuals with extreme immunosuppression (CD4 <200 cells/mm^3)[15,16] and a negative correlation between clinical attachment loss and CD4+ cell counts <200 cells/mm^3[12,14].

The authors are not aware of any study on the prevalence and associated risk factors for chronic periodontitis in HIV positive patients in Nigeria. The aim of this study was therefore to determine the prevalence of chronic periodontitis and the predictors for periodontitis in HIV positive patients attending the HIV outpatient clinic of the Lagos University Teaching Hospital, Nigeria.

2. Materials and methods

2.1. Study population and sample collection

This was a descriptive cross sectional study by design. A total of one hundred and twenty HIV seropositive patients were recruited into the study. The sample size was determined using the formula: $n=Z^2\times pq/d^2$, where n=minimum sample size, Z=critical value set at 95% confidence level, p=prevalence of periodontal disease from a previous study, q=1-p, d=precision level set at 0.05. Their HIV seropositive status was confirmed by Western Blot method following voluntary counselling and testing. Only patients 18 years old and above who were not on highly active antiretroviral therapy were included in the study. Exclusion criteria included pregnancy, diabetes, antibiotic therapy and recent periodontal therapy (in the last six months).

All the patients were attending the HIV outpatient clinic of the Lagos University Teaching Hospital.

Verbal informed consent was obtained before clinical periodontal examination. The study protocol was approved by the Health Research and Ethics Committee of the Lagos University Teaching Hospital. A semi-structured interviewer-administered questionnaire was used to obtain socio-demographic data of the patients. The selected periodontal parameters utilized in the study were the community periodontal index of treatment needs (CPITN)[17,18] and the simplified oral hygiene index[19]. The highest CPITN score for each patient was recorded and used to determine the prevalence of chronic periodontitis. A healthy periodontal status was based on CPITN score 0, CPITN score 1 (bleeding), CPITN score 2 (calculus), CPITN score 3 (shallow pockets 4-5 mm) and CPITN score 4 (deep pockets ≥6mm). Patients with highest CPITN scores 1, 2 were further classified into non-periodontitis group, while those with highest CPITN scores 3, 4 into periodontitis group[19]. The severity of periodontitis was assessed by the mean number of sextants with CPITN scores 3, 4. The number of sextants exhibiting bleeding on probing was further categorized into two groups, <3 sextants and ≥3 sextants.

A single examiner performed the periodontal evaluations following intra-examiner calibration.

Blood samples were taken at the time of periodontal examination to evaluate CD4+ cell count. Blood (4.5 mL) was taken from one of the veins of the antecubital fossae by venepuncturing using the vacutainer system. The blood specimen was then used for assay of the CD4+ cell count by semi-automated technique using PARTEC Cyflowmetry (made by Partec GmbH Germany) and was recorded as cells/mm^3. The record of the CD4+ cell count was retrieved from patients' hospital records and was used to categorize the patients into those with <200 cells/mm^3, 200-499 cells/mm^3 and ≥500 cells/mm^3[20].

2.2. Statistical analysis

The SPSS software package version 18 was used for statistical analysis. Categorical variables: gender, education and oral hygiene status were reported as frequencies and percentages, while continuous variables: age, mean number of sextants with highest CPITN scores were reported as means±SD. Differences between the factors of exposure [socio-demographic variables, oral hygiene status, CD4+ cell count and the outcome (periodontitis)] were determined in a bivariate analysis (ANOVA or Pearson's chi square where appropriate). Multivariate logistic regression analysis was then performed using factors that were significantly associated with periodontitis in the bivariate analysis as the independent variables and periodontitis as the dependent variable. A confidence interval of 95% was used, the level of significance was set at $P<0.05$.

3. Results

A total of 120 HIV positive patients were recruited for this study, consisting of both males and females and 64.2% of the

study population were females (Table 1). The mean age of the HIV positive patients was (35.5±9.8) years (range 19-72 years). There was a statistically significant difference in age according to gender. Females were younger than the males (32.4±8.9) years versus (41.1±8.9) years, $P<0.0001$) respectively.

Table 1

Age and gender distribution of the HIV positive patients.

Gender	No. of patients (%)	Mean age±SD (in years)	Age range
Male	43 (35.8)	41.1±8.9	30-72
Female	77 (64.2)	32.4±8.9	19-61
Total	120 (100.0)	35.5±9.8	19-72

Table 2 shows other socio-demographic characteristics of the studied subjects. Majority (50%, n=60) of the HIV positive patients had secondary school education as their highest level of education, followed by those with primary education (26.7%, n=32), then tertiary level of education (20%, n=24). Slightly over half (55.8%) of the studied subjects were married. Twenty six (21.7%) of the patients gave a history of smoking.

Table 2

Distribution of the socio-demographic characteristics of the HIV positive patients.

Variable	No. of patients (%)
Educational level	
None	4 (3.3)
Primary	32 (26.7)
Secondary	60 (50.0)
Tertiary	24 (20.0)
Total	120 (100.0)
Marital status	
Single	39 (32.5)
Married	67 (55.8)
Divorced/Widowed	14 (11.7)
Total	120 (100.0)
Smokers	
Yes	26 (21.7)
No	94 (78.3)
Total	120 (100.0)

Table 3 captures the oral hygiene status of the HIV positive patients. Slightly more than half (52.5%) had fair oral hygiene while less than a third (30.8%) had good oral hygiene. Table 4 reveals the distribution of the highest CPITN score among the HIV positive patients. The most prevalent score was CPITN score 3 (55%), which was higher among male (67.4%) than female patients (48.1%). None of the HIV male patients had a CPITN score 0. Periodontitis (highest CPITN score 3, 4) was more prevalent (63.3%) than non-periodontitis (highest CPITN score 0, 1, 2) (36.7%) in the studied subjects (Table 5).

Table 3

Distribution of the oral hygiene status of the HIV positive patients.

Oral hygiene status	Frequency n (%)
Good	37 (30.8)
Fair	63 (52.5)
Poor	20 (16.7)
Total	120 (100.0)

Table 4

Distribution of the highest CPITN score of the HIV positive patients.

Gender	Highest CPITN score				
	0	1	2	3	4
Male	0 (0.0)	0 (0.0)	10 (23.3)	29 (67.4)	4 (9.3)
Female	2 (2.6)	2 (2.6)	30 (39.0)	37 (48.1)	6 (7.8)
Total	2 (1.7)	2 (1.7)	40 (33.3)	66 (55.0)	10 (8.3)

Table 5

Periodontal status of HIV positive patients.

Gender	Non-periodontitis (CPITN score 0, 1, 2) n (%)	Periodontitis (CPITN score 3, 4) n (%)
Male	9 (20.9)	34 (79.1)
Female	34 (44.2)	43 (55.8)
Total	43 (35.8)	77 (64.2)

Chi square=5.5, df=1, P=0.019.

Table 6 reveals that the majority of HIV patients with the CD4+ cell count (45%) were those with <200 cells/mm^3 CD4+ cell. The mean CD4+ cell count in the HIV positive patients was (255.6±190.4) cells/mm^3 (range 10-851). The median CD4+ count was 222 cells/mm^3.

Table 6

Distribution of the CD4+ cell counts of the HIV positive patients.

CD4+ cell counts (cells/mm^3)	Frequency n (%)
<200	54 (45.0)
200-499	52 (11.7)
≥500	14 (43.3)
Total	120 (100.0)

Table 7 reveals the association between periodontitis and some variables in a bivariate analysis. Age, gender and the number of sextants exhibiting bleeding on probing had significant associations with periodontitis ($P<0.05$). The mean age of patients with periodontitis was (36.9±10.50) and significantly higher (P=0.04) than that of the non-periodontitis group (33.1±8.03). The odds of individuals ≥35 years of having periodontitis versus non-periodontitis was 2.52 (95% CI, 1.17-5.45). The association between CD4+ cell counts and periodontitis revealed that the prevalence of periodontitis was only slightly higher in patients with CD4+ cell count <200 cells/mm^3 compared to those ≥200 cells/mm^3, and the difference was not statistically significant ($P>0.05$).

Table 7

Association between socio-demographic variables, oral hygiene and CD4+ cell count and periodontal status of the HIV positive patients.

Variable	Non-periodontitis (CPITN Score 0, 1, 2) n (%)	Periodontitis (CPITN Score 3, 4) n (%)	P value
Age (in years)			
< 35	29 (46.8)	33 (53.2)	0.018*
≥35	15 (25.9)	43 (74.1)	
Gender			
Male	10 (23.3)	33 (76.7)	0.023*
Female	34 (44.2)	43 (55.8)	
Educational level			
None	3 (75.0)	1 (25.0)	0.306
Primary	9 (28.1)	23 (71.9)	
Secondary	23 (38.3)	37 (61.7)	
Tertiary	9 (37.5)	15 (62.5)	
Smokers			
Yes	7 (26.9)	19 (73.1)	0.350
No	37 (39.4)	57 (60.6)	
Oral hygiene index score			
Good	17 (45.9)	20 (54.1)	0.152
Fair	23 (36.5)	40 (63.5)	
Poor	4 (20.0)	16 (80.0)	
Bleeding sextants			
< 3	27 (47.4)	30 (52.6)	0.021*
≥3	17 (27.0)	46 (73.0)	
CD4+ cell count (cells/mm^3)			
< 200	19 (35.2)	35 (64.8)	0.938
200-499	20 (38.5)	32 (61.5)	
≥500	5 (35.7)	9 (64.3)	

* Statistically significant

Table 8 reveals the association between some of the socio-demographic variables and oral hygiene and CD4+ cell counts in HIV positive patients. The mean number of sextants with CPITN score 3 and 4 were significantly associated with older age ≥35 years (P=0.021), male gender (P=0.005), positive smoking status (P=0.040) and ≥3 sextants exhibiting bleeding on probing (P=0.004). The level of education, oral hygiene status and CD4+ cell counts were not significantly associated with the severity of periodontitis in the HIV positive patients (P>0.05).

Table 8

Association between socio-demographic variables, oral hygiene and CD4+ cell counts and periodontitis in HIV positive patients.

Variable	Mean number of sextants with CPITN score 3, 4	P value
Age (in years)		
< 35	1.03	0.021*
≥35	1.59	
Gender		
Male	1.74	0.005*
Female	1.05	
Educational level		
None	0.25	0.318
Primary	1.53	
Secondary	1.25	
Tertiary	1.29	
Former/Current smokers		
Yes	1.77	0.040*
No	1.17	
Oral hygiene index score		
Good	1.14	0.141
Fair	1.22	
Poor	1.85	
Bleeding community periodontal index sextants		
< 3	0.95	0.004*
≥3	1.62	
CD4+ cell count (cells/mm^3)		
< 200	1.26	0.988
200-499	1.35	
≥500	1.29	

*Statistically Significant.

Following a logistic regression analysis in Table 9, gender and a positive smoking status were non contributory to periodontitis (P=0.668 and P=0.278) respectively.

Table 9

Binary logistic regression analysis of dependent variable (CPITN score 3, 4), significant variables-age (odds ratio 1.057, 95% CI 1.005 to 1.111, P=0.030), sextants exhibiting bleeding on probing (odds ratio 1.738, 95% CI 1.339 to 2.256, P=0.000).

Step 1[a]	B	S.E.	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Gender (1)	0.259	0.604	0.184	1	0.668	1.296	0.397	4.235
Age	0.056	0.026	4.716	1	0.030	1.057	1.005	1.111
Sextants exhibiting bleeding on probing	0.553	0.133	17.228	1	0.000	1.738	1.339	2.256
Positive smoking status	0.682	0.629	1.178	1	0.278	1.979	0.577	6.786
Constant	-4.337	1.105	15.404	1	0.000	0.013		

[a]Variable(s) entered on step 1: gender, age, sextants exhibiting bleeding on probing, positive smoking status. B: the coefficient for the constant in the null model. S.E.: the standard error around the coefficient for the constant. Sig: means level of statistical significance.

Older age ≥35 years and ≥3 sextants exhibiting bleeding on probing were significantly associated with periodontitis (P<0.05). The mean number of sextants exhibiting bleeding on probing in patients with periodontitis was (3.04±1.81) and was significantly higher (P=0.002) than that of non-periodontitis group (1.93±1.85). The odds of patients with ≥3 sextants exhibiting bleeding on probing of having periodontitis was 1.74 times (95% CI, 1.34-2.36, P<0.001) greater than in patients with <3 sextants exhibiting bleeding on probing. Older age ≥35 years was significantly associated with periodontitis (P=0.030) in the HIV positive patients.

4. Discussion

The aim of this study was to determine the prevalence of chronic periodontitis and associated risk factors in a group of HIV positive Nigerians. To the authors' knowledge, this is the first study on the prevalence of chronic periodontitis among HIV positive Nigerian patients, while the periodontal status of HIV positive persons has been reported in other sub-Saharan African countries like South Africa[12,21,22]. The established CPITN was utilized in this study, because of its major advantages of simplicity, speed, minimal invasiveness, reproducibility and international uniformity[18]. Furthermore, to enrich this study, the authors modified the CPITN by taking into consideration the overall number of sextants that demonstrated bleeding on probing among the HIV positive patients in addition to their highest CPITN score. This variable was used as one of the independent variables to determine its predictive role for periodontitis in this study. Previous studies had challenged the assumption that a tooth with score 3 or 4 should also bleed on probing (score 1)[23]. The authors therefore explored the relationship between the number of sextants exhibiting bleeding on probing and periodontitis.

To control for patients' selection bias, the HIV positive patients were recruited from the dedicated HIV outpatient clinic of the Lagos University Teaching Hospital to provide a more representative study population rather than patients presenting to a dental clinic with oral complaints, which could have unduly increased their prevalence of chronic periodontitis. These HIV patients were also highly active antiretroviral therapy-naive.

In the present study, the selected periodontal parameters of the HIV patients reflected a very high prevalence of periodontal disease (98.3%) which is quite similar to the 97.4% reported in another study on HIV positive patients in India[3]. This is not surprising and could be attributed to the lower educational status of these patients because most (80%) of the HIV patients had attained at secondary education and only 20% had tertiary education. Other possible factors that could have accounted for the high prevalence of periodontal disease in the present study are self-reported poor oral hygiene practices of the patients, which include once daily brushing (80.8%) and poor dental attendance (72.5%). This corroborates a previous study[24]. What was more interesting however was the high proportion of HIV patients (63.3%) with chronic periodontitis (CPITN score 3, 4) with a smaller proportion having the advanced form (CPITN score 4). Other studies among different target groups in the general presumably uninfected Nigerian population found CPITN score 2 to be the most prevalent periodontal condition[25,26]. A CPITN score 2 was also reported as the most prevalent score in an HIV

infected Indian population[27]. The proportion of patients with deep pockets ≥6 mm in the present study (8.3%) is similar to the 9.2% recorded in a study among HIV positive patients in India[27] but differs from the 28.4% reported in another population in India[3]. The lower prevalence of chronic periodontitis observed in the present study could be due to the fact that most of the patients in the present study were recently diagnosed with HIV infection and as such may presumably have a measure of comparable immune status to that of the general presumably HIV uninfected population with possible less marked effects of the immune suppression on their periodontal tissues.

The possibility of prior periodontal destruction in these patients before the influence of HIV immune suppression should be considered which calls attention to the need for longitudinal studies in which cause-effect relationships could be explored.

As observed in the present study, the HIV positive patients were predominantly females (69.1%). The higher proportion of females in this study is supported by the National report documenting a disproportionately higher proportion (58.3%) of women and girls among HIV infected persons[2]. The reason may be the higher physiological or biological vulnerability of women to HIV infection. The significantly younger age of HIV female patients in the present study may be related to the risks and vulnerability of young women particularly girls to sexual violence resulting from the inequity in their social, political and economic status in Nigeria[2].

In the present study, HIV positive male patients had a significantly higher prevalence and severity of periodontitis than females, which corroborates a recent Indian study[27]. Male gender has indeed been considered a risk determinant of periodontitis[28,29]. A plausible explanation will attribute this finding to the poorer oral hygiene in the HIV positive males which was actually reported in an earlier study[24]. It should be borne in mind however that its contribution to periodontitis may have been influenced by the significantly older age of the HIV males than the females in the present study. When the level of immune suppression was compared with their highest CPITN score and the severity of periodontitis (mean number of sextants with CPITN score 3, 4), the associations were not statistically significant. In the present study, although, the HIV patients with CD4+ cell counts <200 cells/mm^3 had lower mean number of sextants (CPITN score 3, 4) than those with CD4+ cell counts 200-499 and ≥500 cells/mm^3, yet these associations were not significant. This finding confirms several previous studies among HIV infected persons[16,21,30,31]. Goncalves *et al.* observed that a higher proportion (41.7%) of HIV subjects presenting with severe immunosuppression (CD4+ cell counts <200 cells/mm^3) had better periodontal health than those with higher CD4+ cell counts[16]. Their finding was however not significantly associated with the selected periodontal parameters. On the contrary, some studies found a significant association between CD4+ cell counts and chronic periodontitis[12,27]. John *et al.* found significant associations between CD4+ cell counts and probing depth and clinical attachment level[12]. However, the CD4+ cell counts in their study population were not associated with the severity of periodontal disease. Rozra *et al.* also observed a higher percentage of periodontitis (as expressed by CPITN score 3, 4) among HIV infected subjects with CD4+ cell counts <200 μL than those with ≥200 μL[27]. The variance between these studies and the present study may be explained by the influence of existing contributory factors such as smoking, age, gender and sextants exhibiting bleeding on probing to the prevalence and severity of periodontitis. Genetic factors cannot also be ruled out owing to the racial differences in the different study populations. It is well known that chronic periodontitis is multifactorial. Other factors other than the level of immune suppression may therefore be important in determining the pattern of periodontal tissue destruction even in HIV positive patients.

Furthermore, the severity of immunosuppression was reported to be more associated with atypical periodontitis than with chronic periodontitis in another study[32]. The higher levels of interleukin IL-18 in the gingival crevicular fluid in gingivitis and periodontitis sites of HIV positive patients may be responsible for tissue destruction in HIV associated chronic periodontitis[9].

The risk determinants observed to be significantly associated with the selected periodontal parameters in this study include the age of the HIV infected patients. Older patients >35 years of age were observed to have a significantly higher prevalence and severity of periodontitis. This has been reported in other studies[11,12]. Barr *et al.* reported a six times risk for periodontal attachment loss in HIV subjects over 35 years[11]. A more recent study also found age to have a significant correlation with clinical indices such as plaque index, gingival index and probing depth[12]. It is possible that age-related degenerative changes in the periodontal tissues could potentially be a risk factor for increased periodontal tissue destruction with some moderate loss of periodontal attachment and alveolar bone loss[33,34]. Aging alone in healthy elderly persons does not lead to a critical loss of periodontal support[34]. It has however been suggested that the increased level of periodontal tissue destruction observed with aging may be the result of cumulative destruction and the exposure to other risk factors rather than a result of increased rates of destruction[29].

In the present study, smoking was significantly associated with the severity of periodontitis (P=0.040). This observation corroborates findings in a US study[10] and recent findings in HIV-infected South Africans[12]. A higher prevalence of chronic periodontitis has also been reported among the general population in Nigeria[35]. The significant association of smoking with selected periodontal parameter in the present study corroborates the fact that smoking is a well-established risk factor for periodontitis[36]. The association between smoking and periodontitis however became insignificant in the logistic regression analysis. This may be due to the smaller number of HIV positive patients that were smokers in the present study as well as the limited data on the pack years of the smokers which was identified as one of the risk factors in an earlier study[10]. The authors intend to address this gap in information on pack years among HIV positive patients in future studies. Bleeding on probing is widely used as a clinical parameter to monitor periodontal disease progression[37], and has been used to assess the level of gingival inflammation[38]. Clinical trials revealed that bleeding on probing when used as a clinical parameter has a low positive predictive value and the test belongs to disease progression assessment rather than risk assessment. Interestingly, the modification of the CPITN by addition of the number of sextants exhibiting bleeding on probing,

independent of the selected periodontal parameters yielded notable findings. Bleeding of ≥3 sextants was significantly associated with the prevalence (P=0.021) and severity of periodontitis (P=0.004). Furthermore in a logistic regression analysis, only older age ≥35 years (odds ratio 1.057, P=0.030) and bleeding sextants ≥3 (odds ratio 1.738, P=0.000) remained predictive of the severity of periodontitis (≥2 CPITN sextants with score 3, 4). Although, the use of bleeding on probing as a risk assessment has been challenged in a previous review and was viewed as been more suitable for disease progression assessment[39], the association of sextants exhibiting bleeding on probing with periodontitis in the present study merits further investigation.

This study has established a high prevalence of chronic periodontitis in HIV positive Nigerian patients. There is also a significant association of age, smoking and sextants exhibiting bleeding on probing with severity of chronic periodontitis. Sextants exhibiting bleeding on probing and age ≥35 years were found to be independent risk factors for periodontitis among the HIV positive patients in this study.

The CD4+ cell counts were not associated with periodontitis in this study. The high prevalence of chronic periodontitis observed among the HIV positive patients in the present study underscores the importance of periodontal screening of HIV positive patients and the need for early preventive measures such as dental visits with oral prophylaxis.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgements

This work was supported by US President's Emergency Plan for AIDS Relief. Awarded by US department of health and human resources (Health Resources and Services Administration RSA) to The HARVARD School of Public Health PEPFAR/APIN Programme, Phyllis Kanki (PI), Akanmu AS (Co-PI for Lagos University Teaching site). Grant No U51HA025522. 08/21/04 – 02/28/11.

Comments

Background

The human immunodeficiency virus (HIV) infection has remained a global pandemic with an estimated 34 million people living with the infection worldwide. The impact of HIV infection on affected persons could be enormous, causing numerous health challenges, including a variety of opportunistic infections and chronic periodontitis.

Research frontiers

The present research provides finding of the risk determinants and prevalence of chronic periodontitis in Nigeria, which is limited in that area.

Related reports

The selected periodontal parameters utilized in the study were the CPITN (Ainamo *et al.*, 1982; WHO Oral Health Survey, 1997). In addition, CDC in 1992 revised classification system for HIV infection and expanded surveillance case definitions for AIDS among adolescents and adults.

Innovations & breakthroughs

The present study reports the prevalence of chronic periodontitis and its determinant in Nigeria.

Applications

The research work encourage the need for more surveillance on the maintenance of oral health of HIV patients in Nigeria.

Peer review

In this study the authors evaluated the prevalence and determinants of chronic periodontitis in HIV positive patients. And the results shows the prevalence of periodontitis, and their CD4 amongst HIV patients.

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