Risk factors associated with oral lesions in HIV-infected heterosexual persons and intravenous drug users in Thailand

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Wipawee Nittayananta[1], Nilnara Chanowanna[1], Sasithorn Sripatanakul[1], Supis Chungpanich[1], and Than Winn[2]

[1] Department of Stomatology, Faculty of Dentistry, Prince of Songkla University, Thailand

[2] Epidemiology Unit, Faculty of Medicine, Prince of Songkla University, Thailand

Address for correspondence: Dr. Wipawee Nittayananta
Department of Stomatology
Faculty of Dentistry
Prince of Songkla University
Haadyai, Songkhla 90112, Thailand
Fax: 66-74-212-922
Email: nwipawee@ratree.psu.ac.th

Short title: Risk factors for oral lesions in Thai people with HIV

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Abstract

This study was aimed to identify factors associated with the presence of oral lesions in HIV infected individuals in Thailand and to determine the influence of gender and route of HIV transmission on the prevalence of the lesions. Two hundred and seventy-eight HIV-infected heterosexual persons and intravenous drug users (IVDUs) were enrolled (230 males, 48 females). Eighty-six HIV-free subjects from the same population were included as controls (61 males, 25 females). Oral candidiasis was the most common oral lesion among HIV-infected individuals (39.6%), followed by hairy leukoplakia (HL) (26.3%), exfoliative cheilitis (18.3%), and linear gingival erythema (LGE) (11.5%). Odds ratio (OR) for factors associated with the presence of oral lesions were as follows; advanced HIV disease defined by both clinical status; symptomatic stage [OR=18.6; 95% confidence interval (CI) 7.3-47.2], AIDS stage [OR 7.3; 95% CI 3.4-15.7] and laboratory investigation of total number of lymphocytes cell count of 1,000-2,000 cell/mm^3 [OR 2.7; 95% CI 1.4-5.1] and <1,000 cell/mm^3 [OR 4.0; 95% CI 2.3-7.0], alcohol consumption [OR 3.4; 95% CI 1.3-9.1], and poor oral health [OR 1.7; 95% CI 1.0-2.9]. Men were significantly more likely to have oral lesions than women. No statistically significant difference on the presence of oral lesions was observed between the heterosexual persons and IVDUs. This study should help predict the risk of acquiring various types of oral lesion, given that the person is exposed to multiple risk factors compared to another who is not exposed to these factors.

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Key words: AIDS, alcohol, gender, heterosexual, HIV, intravenous drug user, oral lesion, risk factors, smoking, Thailand

Address for correspondence: Dr. Wipawee Nittayananta, Department of Stomatology, Faculty of Dentistry, Prince of Songkla University, Haadyai, Songkhla 90112, Thailand, Fax: 66-74-212-922, Email: nwipawee@ratree.psu.ac.th

Thailand is one of the countries that is confronted with a high prevalence of the human immunodeficiency virus (HIV) infection. It is estimated that 1.2 million people out of a population of 60 million are currently infected with HIV. Eighty-three percent of these individuals become infected heterosexually and five percent by intravenous drug use, with a male to female ratio of four to one (1).

The HIV infection is a well-established risk factor for the development of specific oral lesions, including oral candidiasis, HL, periodontal diseases, and neoplasms (2-8). These lesions are more likely to occur in patients who have a greater degree of immune suppression as measured by $CD4^+$ cell counts (3, 9, 10). In addition, persons who have HL or oral candidiasis are at risk of accelerated progression to AIDS compared with persons without these lesions (11-16).

The risk of occurrence of oral lesions has been identified in different groups of HIV infected persons (2, 17, 18). The prevalence of oral lesions by gender and route of HIV transmission have been analysed in some previous studies (6, 8, 19, 21), from different geographical locations, mainly in western countries (6, 18-21). However, little is known about the factors associated with the presence of oral lesions among people with HIV in Asian countries.

It is of great importance to identify persons who have a greater risk of developing oral lesions in order to intervene, aiming to reduce the severity and frequency of the lesions. This is important since such patients usually suffer from pain or discomfort

and have difficulty in eating, which may lead to weight loss, dehydration, malnutrition, and the HIV wasting syndrome (22).

Thus, the purpose of this study was (1) to identify risk factors for the presence of oral lesions in HIV seropositive individuals in Thailand and (2) to determine the influence of gender and route of HIV transmission on the prevalence of the lesions.

Materials and methods

A cross-sectional study was performed in six hospitals, in the northern and southern Thailand. The study population comprised HIV-seropositive and seronegative heterosexual persons and IVDU who were at least 16 years of age. They were given both verbal and written information about the nature of the study and written consent was obtained. Subjects were excluded if they were severely ill.

HIV-seropositive individuals

Two hundred and seventy eight persons (age range 16-65 years, mean age 31.9 years) previously diagnosed as seropositive for HIV, using a particle agglutination test (SERODIA®-HIV, Fujirebio Inc., Shinjuku-ku, Tokyo, Japan) and enzyme-linked immunosorbent assay (ELISA) (Enzygnost® Anti-HIV 1/2 Plus, Behring, Behringwerke AG, Marburg, Germany), were asked to participate in the study. They belonged to the two main Thai groups with HIV; heterosexuals and IVDUs. The heterosexual group consisted of 186 individuals (age range 21-65 years, mean age 32.4 years), both in northern and southern Thailand. In the north the cases included

hospitalized at medical wards in Chiang Rai Hospital in the Chiang Rai province, Lampang Hospital in the Lampang province, and Phayao Hospital in the Phayao province, during January and April 1997. In the South the patients were either in a medical ward, or attended an Outpatients Clinic at the Prince of Songkla University Hospital, in the Songkhla province, during April 1996 to August 1997. The IVDUs group consisted of 82 individuals (age range 16-50 years, mean age 30.4 years), mainly in the South, who received methadone at Hat Yai Regional Hospital, in the Songkhla province, during April 1996 to August 1997.

HIV-seronegative individuals

Eighty six of the HIV-seronegative persons were enrolled (age range 17-63 years, mean age 33.1 years) and comprised of 37 individuals assumed to be HIV-free (age range 19-63 years, mean age 36.7 years), who attended the Dental Hospital, at the Prince of Songkla University, to receive routine dental treatment and those who had been hospitalized in the medical ward, Prince of Songkla University Hospital, because of some systemic diseases during April 1996 to August 1997. As all individuals who attend the IVDU Unit, Hat Yai Regional Hospital, had to be tested routinely for HIV seropositivity, 49 persons who were HIV-seronegative were asked to participate as controls (age range 17-58 years, mean age 30.6 years).

The following information of each patient were recorded on a special designed proforma: age, gender, nutritional status, health status, risk group and stage of HIV infection, immune status, medications, smoking habit and alcohol consumption, presence of denture, plaque index, and presence of oral lesions and their locations.

A detailed explanation pertaining to the above parameters are given below:-

Nutritional status

Categorization of nutritional status into three different levels; normal, low or high was made according to the standard weight for Thai people, from which normal weight was determined as 90% of the World Health Organization (WHO) standard weight (23).

Risk group of HIV infection

The risk group was determined by asking the patients about their behaviour and categorizing into three different groups; heterosexual, IVDUs, and others. Persons who belonged to both heterosexual and IVDUs were grouped as IVDUs, as we considered the risk of becoming HIV infected from a contaminated needlestick, is higher than that of sexual intercourse.

Stage of HIV infection

The stage of HIV infection was categorized into three different stages; asymptomatic, symptomatic and AIDS, in accordance with the WHO clinical staging criteria (24).

Determination of immune status

The immune status of all subjects was determined by the total lymphocytes count per mm^3, as an alternative laboratory marker, because facilities for determination of $CD4^+$ T-cell counts were not available (24).

Medications

Medications used by the patients were assessed by interview and/or looking through the patients' medical record. The medications taken by individuals at the day of examination were recorded, and medications commonly prescribed were categorized into five different groups; antifungal (i.e. Ketoconazole, Itraconazole, Fluconazole), antiviral (Zidovudine, Zalcitabine), antibacterial (Isoniazid, Rifampicin, Ethambutol), antidepressant (Amitriptyline, Nortriptyline), and others.

Smoking habits and alcohol consumption

Patients were asked about their smoking habits and categorized into three groups; non-smoker, previous smoker and current smoker. Patients were also asked about alcohol consumption and categorized into three groups; teetotaler, previous alcohol drinker and current alcohol drinker.

Presence of denture

Presence or absence of removable dentures was recorded and the denture wearers categorized into three groups as those with upper denture or lower denture or both upper and lower dentures.

Plaque index

Plaque accumulation on buccal and mesial surfaces of the following six teeth were recorded; 16, 21, 24, 36, 41, and 44, and was categorized according to the Silness & Loe index (25):

The foregoing demographic data of the study samples are shown in table 1.

Presence of oral lesions

All extra-and intra-oral examinations were performed by a dental practitioner trained in Oral Medicine (WN). Subjects were examined on a dental chair with illumination. The presence of oral lesions, and their locations were recorded primarily based on clinical appearance using the criteria of the EC-Clearinghouse (5). Biopsy and microbiological examination was undertaken when indicated.

Ethics

The study protocol was approved by the research and ethics committee of the Prince of Songkla University, Thailand. All patient information was kept confidential.

Data management and analysis

Data entry was done using SPSS for Windows version 6.1. Data analyses were performed using STATA computer package version 6.0. Initial tabulations were used to describe some pertinent variables and to do chi-square test to determine any significant association between dependent and independent factors. A series of univariate logistic regressions were done for selection of important predictors of oral lesions, to fit a multivariate model later. A variable was selected if the Wald's test gave a *P-value* of .2 or less. ORs were computed to estimate relative risk and values greater than 1 are risk and less than 1 are protective of the oral lesions.

Analysis was performed in two stages. In the first stage, a series of univariate logistic regressions were done to select candidate variables, which were found to be significantly associated with each of the outcome variables, namely presence of any

form of oral lesion, oral candidiasis, erythematous lesion, pseudomembranous lesion, HL, exfoliative cheilitis, and LGE. Our main exposure variable being HIV/AIDS status of the individuals, namely whether the person was HIV-negative (37 out of 86 or 43% in this group were not IVDUs and therefore were not tested for HIV), or HIV-positive at asymptomatic, symptomatic or AIDS stage. The reference categories for other exposure variables were female gender, younger age (≤ 30 years), non-smokers, teetotalers, good nutrition, no medication with a specific drug, weight loss, no denture, low plaque index (≤ 16 scores) and lymphocyte count of >2,000 cell/mm^3. In the second stage, the candidate variables selected were fit in the multiple logistic regression model in a stepwise fashion. A maximum likelihood ratio test was used in eliminating variables, which are not important either as an independent risk factor or a confounder. Separate models were fit for each of the outcome variables.

In the final multivariate models, ORs and 95% CI values show the levels of association between each outcome and important predictors. The OR estimates the relative risk of the exposed subject compared to the unexposed subject developing oral lesions, due to a particular exposure variable adjusting for other variables in the model.

Results

Prevalence of oral lesions

Prevalence of oral lesions and ORs for the presence of oral lesions in HIV-infected individuals compared to HIV-free subjects are shown in Table 2. One hundred and eighty-four HIV-infected individuals (66.2%) and 28 HIV-free subjects (32.6%)

displayed oral lesions [OR 3.7; 95% CI 2.2-6.1]. Oral candidiasis was the most common oral lesion found in 39.6% of HIV-infected persons compared to 4.6% of HIV-free subjects [OR 6.7; 95% CI 3.1-14.9], followed by HL in 26.3% vs 2.4% [OR 6.1; 95% CI 2.4-15.6], exfoliative cheilitis in 18.3% vs 5.8% [OR 2.4; 95% CI 1.1-5.2)], and LGE in 11.5% vs 3.5% [OR 1.9; 95% CI 0.8-4.7]. Other lesions found only in HIV-infected individuals were herpes simplex infection, necrotizing ulcerative gingivitis (NUG), atypical ulcers and penicilliosis. No patient displayed oral neoplasm and necrotizing ulcerative periodontitis (NUP). Table 3 shows the number of oral lesions and the number of sites affected. It is noted that both the number of the lesions and the sites affected were increased with the disease progression. Location of the lesions seen among the patients is shown in table 4. The tongue was the most commonly affected site in HIV-infected persons, followed by hard palate, lip, and labial mucosa.

Risk factors for the occurrence of oral lesions

Risks of occurrence of at least one oral lesion among the patients are shown in Table 5. The table also shows the ORs for factors associated with the presence of oral candidiasis; pseudomembranous and erythematous types, HL, exfoliative cheilitis and LGE. The factors such as the stage of HIV infection, a number of lymphocyte cell counts, alcohol consumption and poor oral health were found to be statistically associated with the occurrence of oral lesions. Of interest, alcohol consumption was found to be a statistically significant risk factor for the presence of oral candidiasis [OR 1.9; 95%CI 1.0-3.4; P= 0.038], in particular the erythematous type [OR 2.7; 95% CI 1.4-5.1, P= 0.000]. Antimycotic therapy was found to be a protective effect for the

occurrence of oral candidiasis [OR 0.2; 95% CI 0.1-0.5, *P*= 0.000]. Gender was found to be associated with the occurrence of HL, as the lesion was seen more frequently among men rather than women. [OR 2.5; 95% CI 1.0-5.9; *P*= 0.044]. No statistically significant difference of the presence of oral lesions was found in the patients with different risk groups of HIV infection.

Discussion

This study reveals that oral lesions are common among HIV-infected persons compared to HIV-free subjects, in which persons with HIV are 3.7 times more at risk of the lesions developing than those without HIV. Even when severely ill HIV-free subjects who had been admitted into the hospitals were included. This finding emphasizes the strong association between HIV infection and the occurrence of oral lesions, though some of these lesions have been described in patients with a low immune status, who did not have an HIV infection (26, 27). Previous studies have estimated that more than 90% of HIV-infected individuals will have at least one oral manifestation at some time during the course of their disease (28, 29).

Oral candidiasis and HL were the two most prevalent types of oral lesions, among the patients infected with HIV in the present study, as reported by our previous studies (8, 30) and by others (2, 31, 32). Some studies have reported that there is a concurrent association between HL and oral candidiasis of any form (20, 21). Similar findings have also been observed in our study (OR 3.5; 95% CI 2.0-5.8; *P* = 0.000). The high co-prevalence of oral candidiasis and HL among the patients suggests that if clinicians

find one of these lesions, they should thoroughly examine the patient for the other (20).

Risk factors associated with the presence of oral lesions, among HIV-infected persons have been reported from different populations, mainly in western countries (17, 18, 21). To our knowledge, the present study is the first study attempting to identify risk factors associated with the presence of oral lesions, among people with HIV in an Asian country, with a relative high prevalence of HIV infection. The results of the study suggest that the presence of oral lesions in this patients group is predicted by several factors, including advanced HIV disease, defined by both clinical status and the total number of lymphocyte counts, alcohol consumption and poor oral health.

Advanced HIV disease has been previously reported to be significantly predicted the presence of oral lesion (3, 7, 18, 33). The risk for oral lesions has been found to be increased when further immunologic impairment defined as a $CD4^+$ cell count below 200 cell/mm^3 develops (7, 12, 34). According to the high cost of a measurement of $CD4^+$ cell count, the immune status of the patients in our study was determined by using the total number of lymphocyte cell counts as suggested by the WHO (24). It was found that the low number of lymphocyte cell counts of between 1,000-2,000 and less than 1,000 cell/mm^3, which is equivalent to $CD4^+$ cell counts of between 200-500 and less than 200 cell/mm^3 respectively (24), were significant risk factors for the presence of oral lesion. Thus, it is recommended that in developing countries where $CD4^+$ cell counts cannot be performed, the total number of lymphocyte cell counts may be used.

In our study, the number of lesions and the number of sites affected were statistically significant in association with disease progression. These are in agreement with the study by GLICK *et al.* (7), who found that the number of different concurrent intra-oral lesions, among HIV-infected persons, are associated with severe immune suppression and AIDS. Thus, thorough oral examinations are an essential component for early recognition of disease progression and comprehensive evaluation of HIV-infected patients. Our study also shows that the tongue was the most prevalent affected site of the lesion among HIV-infected patients. Therefore, careful examination of the tongue is suggested for patient at high risk categories.

Effects of alcohol on the presence of oral lesions, among HIV-infected individuals, have been reported (18, 35, 36). In a study by MCCARTHY *et al.* (35), persons consuming more than 8.5 L of absolute alcohol per year are more likely to have oral candidiasis than teetotaler. In our study, alcohol was also found to be a significant risk factor for the presence of oral candidiasis, in particular of the erythematous type [OR 2.7; 95% CI 1.4-5.1; P= 0.002]. Alcohol is associated with atrophy and disruption of the stratification pattern of the oral mucosa (37, 38). This may facilitate the adhesion of *Candida* which leads to the presence of erythematous candidiasis. In contrast, alcohol was not found to be associated with the presence of HL in our study. This finding is in agreement with the study by BOULTER *et al.* (36), in which alcohol has been found to be a decreased risk factor associated with Epstein-Barr virus (EBV) replication in oral epithelial cells of HIV-infected individuals (36), and the expression of the epithelium EBV receptor depends on the extent of mucosal differentiation (39).

Smoking has been reported as a risk factor for specific oral lesions, both in immunocompetent and immunocompromised hosts (18, 28, 40-41). In a small study of denture wearers presumed not to be infected with HIV, candidiasis was more frequent in smokers, even when denture hygiene was considered (40). A study by PALMER *et al.* (18), revealed that tobacco use predicted the presence of any oral lesion, erythematous candidiasis and HL, in a dominant risk group of homosexual men with HIV. This finding is compatible with the findings in a similar study by Greenspan et al (1993). In a small study of 71 patients by MCCARTHY (28), it was also detected that oral candidiasis was more common among smokers with HIV. Recently, a study by PALACIO *et al.* (42), revealed that after adjusting for $CD4^+$ cell count, current smokers were significantly more likely to have oral candidiasis and warts, and less likely to have aphthous ulcers than were current non-smokers. In our study, however, smoking was not found to be associated with the presence of oral candidiasis. Further studies are needed to clarify whether the different findings between our study and those from western countries resulted from the difference in tobacco product and/or host factor.

An association of age and the presence of oral lesions among HIV-infected persons have been reported (20, 45). In our study, persons of older than 30 years were found to have a statistically significant less risk of oral lesions developing, than those younger subjects. In a study by HILTON *et al.* (20) higher odds of HL before the age of 40 years, but no association between age and the occurrence of oral candidiasis was observed. In contrast, EYSTER *et al.* (45) reported higher incidence rates of both oral

candidiasis and HL among hemophiliacs over 18 years of age, compared with younger person; however, they did not report the age distribution or the uppermost age of their subjects. These contradictory findings suggest further investigations.

Various types of medications used among HIV-infected individuals may influence the actual prevalence of oral lesions. As antiviral medication can induce an increase in the $CD4^+$ cell counts, one might hypothesize that use of this drug would reduce the risk of oral lesions. In fact, a study by LAMSTER *et al.* (17) revealed that antiviral drug use and antibiotic use were significant risk factors for the presence of oral lesions in HIV seropositive homosexual men. Whereas, only exposure to antiviral drugs was significantly correlated with the lesion presence for HIV seropositive IVDUs. A positive association between antiviral use and oral candidiasis occurrence was also observed in a study by HILTON *et al.* (20). A study by PALMER et al. (18), revealed reverse causality of anti-fungal on the occurrence of oral candidiasis, in which people who taking anti-fungal drugs were more likely to have oral candidiasis than those not (18). In contrast, our study revealed a strong negative relationship between the use of anti-fungal drugs and the presence of oral candidiasis among the patients. Antibacterial drugs use was found to be associated with the occurrence of the lesion in our study, although not a statistically significant difference. Of interest, antidepressant drugs use was a statistically significant risk factor for the presence of erythematous candidiasis among the patients. This may be a result from decreased salivary flow, as a side effect of this drug, which affects the protective function of saliva. Therefore, prescription of this drug for HIV-infected individuals should be done with caution of this consequence.

The relationship between HIV-associated oral lesions and gender has been reported (43, 44) In our study, men were significant more likely to develop HL than women. This finding is similar to that of a study by SHIBOSKI *et al.* (44), which found that the odds of having HL were 2.5 times higher for men than for women. A study by HILTON *et al.* (20), reported that males who were infected through blood transfusion had a minor increase in HL over women [OR 1.37; 95% CI 0.77-2.47]. Whereas, in a study by ARENDORF *et al.* (43), heterosexual males revealed a higher prevalence of all oral lesions combined compared with heterosexual females. As EBV is known to be associated with the presence of HL, further investigations are needed to explore whether the relation between gender and HL is resulted from a difference in the mode of expression of the virus in the oral epithelium.

Few studies have been conducted to analyse the relationship between HIV-associated oral lesions and HIV transmission category (6, 17, 19, 20, 43, 45). The studies have typically been conducted in geographical locations other than Asian countries and predominantly in homosexual western people rather than in heterosexual persons. In our study, in which the majority of the study samples were men, no statistically significant difference of the risk for occurrence of oral lesions was found between heterosexual persons and IVDUs. This finding was in agreement with a study by SCHMIDT-WESTHAUSEN *et al.* (19), which revealed that the prevalence of oral candidiasis and HL in German women was similar among those infected heterosexually or by intravenous drug use. Some other studies have been conducted to analyse the relationship between HIV-associated oral lesions and routes of HIV transmission (17, 20, 21, 43). The results of the studies vary according to risk groups

studied, for example; in a study by RAMIREZ-AMADOR *et al.* (21), it has been reported that HL was slightly higher in transfusion-infected subjects than in sexually-infected individuals. Whereas, in a study by HILTON *et al.* (20), no difference in risk of oral candidiasis and HL was found between transfusion recipients and hemophiliacs. When a group of men who have sex with men were compared with IVDUs, similar prevalence of HL has been found in both genders (17). As the results of the studies still contradict each other, further studies are necessary to determine whether the route of transmission does play a role regarding the presence of oral lesions among HIV-infected individuals.

This study revealed that the risk factors associated with the occurrence of oral lesions in HIV infected persons in Thailand, are both similar and different from those found in western countries. Advanced HIV disease determined by both clinical status and the total number of lymphocyte counts, alcohol consumption, and poor oral health are the significant risk factors for the presence of the lesions among Thai people with HIV. Prevalence of oral lesions was different between gender, but no significant difference regarding routes of HIV transmission.

Based on the multivariate model for each of the outcome variable, we might estimate prediction equations for the risk of an individuals acquiring oral lesion, relative to other persons who are not exposed to certain risk factors. For instance, if a person is HIV positive and symptomatic, drinks alcohol and plaque index of >16, he would be at 93 times higher risk to acquire any type of oral lesion compared to a man who is HIV negative, non-alcoholic with plaque index ≤16. Likewise, similar person may be

more than four folds risk of acquiring oral candidiasis, as compared to another person not exposed to these risk factors. Similar lines of analysis may be performed for pseudomembranous and erythematous lesions, as well as HL.

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	(n= 59)	(n= 66)	(n= 153)	
Sex				
male	44 (74.6%)	57 (86.4%)	129 (84.3%)	61 (70.9%)
female	15 (25.4%)	9 (13.6%)	24 (15.7%)	25 (29.1%)
Age (years)				
< 30	37 (62.7%)	25 (37.9%)	59 (38.6%)	36 (41.9%)
≥ 30	21 (35.6%)	41 (62.1%)	92 (60.1%)	48 (55.8%)
Risk group				
Heterosexual	20 (33.9%)	39 (59%)	127 (83%)	37 (43%)
IVDU	38 (64.4%)	24 (36.4%)	20 (13.1%)	49 (57.0%)
Others	1 (1.7%)	3 (4.5%)	6 (3.9%)	0 (0%)
Lymphocytes (cell/ml^3)				
> 2,000	35 (59.3%)	15 (22.7%)	21 (13.7%)	55 (64.0%)
1,000-2,000	10 (16.9%)	18 (27.3%)	29 (19.0%)	9 (10.5%)
< 1,000	1 (1.7%)	22 (33.3%)	91 (59.5%)	6 (7.0%)
Medication use				
antifungal	0 (0%)	19 (28.8%)	90 (58.8%)	3 (3.5%)
antibacterial	4 (6.8%)	33 (50.0%)	119 (77.8%)	5 (5.8%)
antiviral	2 (3.4%)	9 (13.6%)	8 (5.2%)	0 (0%)
antidepressant	15 (25.4%)	17 (25.8%)	13 (8.5%)	23 (26.7%)
others	43 (72.9%)	47 (71.2%)	117 (76.5)	68 (79.1%)

Characteristic	HIV$^+$ (n= 278)			HIV$^-$ (n= 86)
	Asymptomatic (n= 59)	Symptomatic (n= 66)	AIDS (n= 153)	

Smoking habit				
non-smoker	14 (23.7%)	20 (30.3%)	63 (41.2%)	28 (32.6%)
previous smoker	1 (1.7%)	9 (13.6%)	25 (16.3%)	6 (7.0%)
current smoker	43 (72.9%)	37 (56.1%)	64 (41.8%)	34 (39.5%)
Alcohol consumption				
teetotaler	30 (50.8%)	29 (43.9%)	61 (40.0%)	45 (52.3%)
previous drinker	5 (8.5%)	9 (13.6%)	24 (15.7%)	6 (7.0%)
current drinker	23 (39.0%)	28 (42.4%)	68 (44.4%)	34 (39.5%)
Presence of denture	2 (3.4%)	5 (7.6%)	13 (8.5%)	10 (11.6%)
Plaque index				
< 16	35 (59.3%)	29 (44.0%)	79 (51.6%)	49 (57.0%)
≥ 16	24 (40.7%)	37 (56.1%)	74 (48.4%)	37 (43.0%)

Table 2 Prevalence of oral lesions among Thai people with different status of HIV infection; n (%)*

Lesion	HIV^+ (n=278)	HIV^- (n=86)	OR (95% CI)

Any oral lesion	184 (66.2%)	28 (32.6%)	3.65 (2.20-6.05)
Oral candidiasis	110 (39.6%)	4 (4.6%)	6.68 (3.1-14.86)
pseudomembranous	60 (21.6%)	1 (1.2%)	4.75 (1.84-12.22)
erythematous	69 (24.8%)	5 (5.8%)	3.41 (1.57-7.40)
angular cheilitis	21 (8.6%)	1 (1.2%)	1.94 (0.65-5.75)
Hairy leukoplakia	73 (26.3%)	2 (2.4%)	6.10 (2.38-15.62)
Linear gingival erythema	32 (11.5%)	3 (3.5%)	1.92 (0.78-4.73)
Exfoliative cheilitis	51 (18.3%)	5 (5.8%)	2.35 (1.07-5.16)

*Some patients had more than one type of lesion. There were missing value in some variables.

Table 3 Number of oral lesions and number of sites affected among Thai people with different status of HIV infection

Number of lesion*	HIV^+ (n= 278)	HIV^- (n= 86)

	Asymptomatic (n= 59)	Symptomatic (n= 66)	AIDS (n= 153)	
Normal mucosa	45 (76.3%)	8 (12.1%)	38 (24.8%)	55 (64.0%)
One lesion	9 (15.3%)	24 (36.4%)	42 (27.5%)	20 (23.3%)
Two lesions	3 (5.1%)	13 (19.7%)	38 (24.8%)	5 (5.8%)
Three lesions	0 (0%)	21 (31.8%)	34 (22.2%)	2 (2.3%)
Missing	2 (3.4%)	0 (0%)	1 (0.7%)	4 (4.7%)
Number of sites affected**				
No site affected	18 (30.5%)	20 (30.3%)	84 (54.9%)	20 (23.2%)
One site	21 (35.6%)	26 (39.4%)	29 (19.0%)	41 (47.7%)
Two sites	15 (25.4%)	17 (25.8%)	27 (17.6%)	19 (22.1%)
Three sites	3 (5.1%)	3 (4.5%)	12 (7.8%)	3 (3.5%)
Missing	2 (3.4%)	0 (0%)	1 (0.7%)	(3.5%)

* trend test for number of lesions vs stages of HIV infection-Z= 8.48; p< .001

** trend test for sites affected vs stages of HIV infection-Z= 5.77; p< .001

Table 4 Location of oral lesions among Thai people with different status of HIV infection

Location	HIV^+ (n= 275)			HIV^- (n= 83)
	Asymptomatic (n= 57)	Symptomatic (n= 66)	AIDS (n= 152)	
Lip	2 (3.5%)	14 (21.2%)	42 (27.6%)	4 (4.8%)
Labial mucosa	2 (3.5%)	16 (24.2%)	34 (22.4%)	4 (4.8%)
Hard palate	2 (3.5%)	22 (33.3%)	30 (19.7%)	11 (13.3%)
Soft palate	0 (0%)	13 (19.7%)	16 (10.5%)	1 (1.2%)
Oropharynx	0 (0%)	6 (9.1%)	17 (11.2%)	2 (2.4%)
Gingiva	5 (8.8%)	7 (10.6%)	35 (23.0%)	4 (4.8%)
Tongue	4 (7.0%)	42 (63.6%)	56 (36.8%)	8 (9.6%)
Floor of the mouth	0 (0%)	3 (4.5%)	7 (4.6%)	1 (1.2%)
Commissure	0 (0%)	6 (9.1%)	17 (11.2%)	1 (1.2%)
Whole mouth	0 (0%)	0 (0%)	6 (3.9%)	0 (0%)

Table 5 Risk of occurrence of oral lesion among Thai people with HIV infection

Factors	Odds ratio	95% Conf. Interval	P value
Any oral lesion			
Asymptomatic	0.45	0.2-1.0	0.058
Symptomatic	18.6	7.3-47.2	0.000
AIDS	7.3	3.4-15.7	0.000
Lymphocyte (1,000-2,000)	2.7	1.4-5.1	0.002
Lymphocyte (<1,000)	4.0	2.3-7.0	0.000
Alcohol (previous drinker)	3.4	1.3-9.1	0.014
Smoke (current smoker)	0.6	0.3-1.0	0.054
Plaque>16	1.7	1.1-2.9	0.051
Age ≥ 30	0.5	0.3-0.9	0.017
Oral candidiasis			
Symptomatic	42.1	15.3-115.9	0.000
AIDS	24.2	8.7-67.3	0.000
Alcohol (current drinker)	1.9	1.1-3.4	0.038
Antibacterial drugs use	1.8	0.9-3.4	0.090
Antifungal drugs use	0.2	0.1-0.5	0.000
Pseudomembranous candidiasis			
Symptomatic	22.0	4.8-106.4	0.000
AIDS	26.6	5.8-127.3	0.000
Nutritional status (underweight)	2.4	1.1-5.6	0.041
Antibacterial drugs use	2.1	1.1-4.4	0.062
Antifungal drugs use	0.3	0.2-0.7	0.001

Factors	Odds ratio	95% Conf. Interval	P value
Erythematous candidiasis			
Symptomatic	19.9	4.8-35.1	0.000
AIDS	5.8	2.2-15.4	0.000
Alcohol (current drinker)	2.7	1.4-5.1	0.002
Antidepressant drugs use	2.2	1.1-4.7	0.036
Antifungal	0.6	0.3-1.2	0.142
Hairy leukoplakia			
Symptomatic	29.2	8.1-105.6	0.000
AIDS	17.2	5.0-58.6	0.000
Male	2.5	1.1-5.9	0.044
Age≥ 30	0.4	0.2-0.7	0.003
Plaque≥ 16	0.5	0.3-0.8	0.011

ปัจจัยเสี่ยงต่อการเกิดรอยโรคในช่องปากในผู้ติดเชื้อเอชไอวี กลุ่มรักต่างเพศและกลุ่มผู้ติดยาเสพติดชนิดฉีดเข้าเส้นในประเทศไทย

บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อหาปัจจัยเสี่ยงต่อการเกิดรอยโรคในช่องปากในกลุ่มผู้ติดเชื้อเอชไอวี ในประเทศไทย และเพื่อศึกษาว่า เพศ และวิธีการส่งผ่านเชื้อเอชไอวี มีผลต่อความชุกของรอยโรคในช่องปากหรือไม่ กลุ่มศึกษาประกอบด้วยผู้ติดเชื้อเอชไอวี กลุ่มรักต่างเพศ และกลุ่มผู้ติดยาเสพติดชนิดฉีดเข้าเส้น จำนวน 278 คน (ชาย 230 คน, หญิง 48 คน) กลุ่มควบคุมประกอบด้วย ผู้ป่วยจากประชากรกลุ่มเดียวกัน แต่ไม่ติดเชื้อ เอชไอวี จำนวน 86 คน (ชาย 61 คน, หญิง 25 คน) จากการศึกษาพบว่ารอยโรคติดเชื้อราในช่องปากเป็นรอยโรคที่พบบ่อยที่สุดในกลุ่มผู้ติดเชื้อเอชไอวี (39.6%) รองลงมาได้แก่ รอยโรคแฮรีลิวโคเพลเคีย (23.3 %) พบว่า Odds ratio (OR) สำหรับปัจจัยที่มีผลต่อการเกิดรอยโรคในช่องปากมีดังนี้ ระยะของการติดเชื้อซึ่งดูจากทั้งอาการทางคลินิกได้แก่ ระยะไม่แสดงอาการ [OR =18.6%; 95% confidence interval (CI) 7.3 –47.2], ระยะเอดส์ [OR 7.3; 95% CI 3.4-15.7] และการตรวจทางห้องปฏิบัติการโดยดูค่าลิมโฟซัยท์ระดับ 1,000-2,000 เซลล์/มม^3 [OR 2.7; 95% CI 1.4-5.1] และ < 1,000 เซลล์/ มม^3 [OR 4.0; 95% CI 2.3-7.0] การดื่มอัลกอฮอล์ [OR 3.4; 95% CI 1.3-9.1] และภาวะสุขอนามัยในช่องปาก [OR 1.7; 95% CI 1.0-2.9] พบว่าเพศชายมีแนวโน้มจะเกิดรอยโรคในช่องปากมากกว่าเพศหญิง แต่ไม่พบความแตกต่างในการเกิดรอยโรคในช่องปากระหว่างผู้ติดเชื้อเอชไอวี กลุ่มรักต่างเพศและกลุ่มผู้ติดยาเสพติดชนิดฉีดเข้าเส้น การศึกษานี้อาจช่วยในการทำนายความเสี่ยงในการเกิดรอยโรคในช่องปาก ในกรณีที่พบว่าผู้ติดเชื้อเอชไอวีรายนั้นมีปัจจัยเสี่ยงใดบ้างเทียบกับผู้ติดเชื้อรายอื่น ๆ ซึ่งไม่มีปัจจัยเสี่ยงดังกล่าว