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## Oral lesions in 166 patients with cutaneous psoriasis: A controlled study

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### Abstract

**Objectives.** This study was aimed to test if the frequency of oral lesions bears statistical correlation or not with the condition of cutaneous psoriasis.

**Study design.** Two groups were examined, one made up of 166 patients with skin psoriasis and the other with the same number of individuals with a negative history of skin diseases (control group), matched by age, race, and sex. Patients with psoriasis were grouped according to their having localized or generalized forms of the disease. The oral mucosa was thoroughly examined in both groups. Data were analyzed using chi-square test, Fisher's test, the odds ratio (OR) with a 95% confidence interval (CI), and the Ryan-Holm step-down Bonferroni procedure. The overall significance was set at  $P \leq 0.05$ .

**Results.** The oral lesions significantly associated with psoriasis were fissured tongue (FT, OR=2.7; 95% CI: 1.3–5.6), and geographic tongue (GT, OR=5.0; 95% CI: 1.5–16.8). Other factors analyzed, such as topical and/or systemic medication for treatment of psoriasis versus nontreated patients, and localized versus generalized forms of psoriasis presented no statistical association with the frequency of FT or GT lesions ( $P > 0.05$ ).

**Conclusions.** Patients with psoriasis presented no specific oral lesion different from those seen in the control group. Although further investigation is warranted to establish whether or not either FT or GT can be characterized as an oral expression of psoriasis, the present investigation did find for both these types of lesions that the frequency of each bore a statistically significant relation with the presence of cutaneous psoriasis.

**Key words:** Psoriasis, oral lesions, geographic tongue, fissured tongue.

## Introduction

The occurrence of oral lesions of psoriasis is a very uncommon event and has been a subject of controversy (1-3). Besides a lack of consensus in regard to a clinical description of what would constitute an oral psoriatic lesion, there are no established histologic criteria by which such a lesion can be conclusively diagnosed (4-7). It has been proposed that the diagnosis of oral psoriasis should only be made when the clinical course of the oral lesions runs parallel to that of the skin and is supported by histologic examination (1-8). Additionally, a positive family history and HLA typing have also been considered of great importance in supporting this diagnosis (1-4, 9,10).

Some authors have even questioned whether an association with cutaneous psoriasis and histologic similarity are enough in themselves to warrant the conclusion that geographic tongue and geographic stomatitis are oral forms of the disease (1,2,5).

This study determined the frequency of oral lesions in patients with psoriasis and compared this frequency with that of a control group. A further goal was to verify if there was any type of oral lesions that could be deemed characteristic of psoriasis.

## Material and Methods

One hundred and sixty-six consecutive patients with biopsy-proven skin lesions of psoriasis, seeking treatment at the Clinic of Dermatology, School of Medicine, University of São Paulo, were enrolled in this study. According to the types of psoriasis the patients presented, they were divided into two subgroups: one with localized forms, which included localized plaque psoriasis, the inverse form and plaque-producing pustular psoriasis; the other with generalized forms, including generalized plaque psoriasis, guttate, generalized pustular and erythrodermic psoriasis. The oral mucosa of these patients was examined for the presence of any oral lesions, the diagnosis being made mainly on a clinical basis. This study was approved by the Committee on Ethics of the Hospital das Clínicas, University of São Paulo, where the study took place; an informed consent was obtained from all participants.

The control group, also with 166 individuals, was selected from a group of 600 patients who came to our school seeking dental treatment from July 2006 to April 2007. The oral mucosa of all 600 was also examined for the presence of any oral lesions, following the same procedure as for the patient group. All patients completed a routine questionnaire concerning their relevant medical history. Patients with a current or past history of any dermatologic disease were excluded. For the selection, files of the patients were shuffled and the first 166 files for which a match was found with a member of the patient group in terms of age, race, and sex were chosen.

Data were analyzed using chi-square with Yates' correction and Fisher's exact test with the aid of the Epi-Info system (version 3.4). In addition, we calculated the odds ratio (OR) with a 95% confidence interval (CI). When more than one hypothesis was tested simultaneously the Ryan-Holm step-down Bonferroni procedure was applied to control the Type I error rate, with overall significance set at  $p \leq 0.05$ .

## Results

The breakdown by gender and race of the patients was 90 men and 76 women, 129 white and 37 non-white. The mean age was 41.9 years (range, 4 to 80 years). The mean duration of the disease was 7.4 years (range, 8 months to 70 years). The difference in the number of men versus women was not statistically significant ( $p=0.153$ ).

The oral lesions recorded in both groups are shown in (Table 1), and the criteria used for diagnosing these lesions (5,6, 11-14) are described in (Table 2). There was a statistically significant difference between the number of patients with oral lesions in the psoriasis group as compared with that of the control group (OR=2.5; 95% CI: 1.6-3.9). No patients with psoriasis developed any oral lesion not found in the control group. The lesions positively related to psoriasis were fissured tongue (FT; OR=2.7; 95% CI: 1.3-5.6), and geographic tongue (GT, OR=5.0; 95% CI: 1.5-16.8). In none of these cases was a biopsy taken. The combination of FT and GT was seen in 17 cases in psoriatic patients (10.2 %), while in the control group the combination was seen in 2 cases (1.2%).

Additional investigations found that FT had a higher frequency in patients over 21 years of age ( $p=0.005$ ). On the other hand, GT was found in equal frequency in all age ranges ( $p=0.681$ ). For the control group there was no statistical difference in terms of age range either for FT ( $p=0.173$ ) or GT ( $p=0.210$ ), although there was a trend for FT to occur more frequently in individuals over 21 years old.

There was no significant difference between the frequencies of either FT or GT in regard to patients being treated for psoriasis (systemic and/or topical medication) or not (FT,  $p=0.345$ ; GT,  $p=0.477$ ). For the control group, there was no significant difference between the frequencies of either FT or GT in relation to the presence of systemic disease or the use of any medication (FT,  $p=0.111$ ; GT,  $p=0.191$ ).

The frequencies of the two previously described subgroups of localized versus generalized forms of psoriasis were almost equal, 53.6% being localized forms and 46.4% generalized forms. Of the localized forms, 87.6% were localized plaques, while the generalized forms consisted of generalized plaques (46.7%), followed by the generalized pustular and erythrodermic forms (26.2% and 15.5%, respectively).

**Table 1.** The main oral findings in psoriasis patients and control group.

	<b>Patients with psoriasis (n =166)</b>	<b>Control group (n =166)</b>	<b>P-value</b>	<b>P'</b>
Patients with no oral lesions	68 (41.0%)	105 (63.2%)	0.00007	---
Patients with 1 or more oral* lesions	98 (59.0%)	61 (36.8%)		
<b>Oral Lesions</b>				
Fissured tongue*	57 (34.3%)	27 (16.2%)	0.0002	0.0016
Geographic tongue*	30 (18.1%)	7 (4.2%)	0.0001	0.0009
Denture stomatitis*	8 (7.8%)	11 (5.4%)	0.636	1
Angular cheilitis**	5 (3.0%)	4 (1.8%)	1	1
Actinic cheilitis*	4 (4.2%)	6 (1.8%)	0.747	1
Oral lichen planus**	2 (1.2%)	3 (1.8%)	1	1
Traumatic keratosis**	1 (0.6%)	6 (3.6%)	0.121	0.847
Fibrome**	4 (2.4%)	2 (1.2%)	0.684	1
Haemangioma**	4 (1.2%)	3 (1.8%)	1	1

*n* = number of patients

\* Chi-square with Yates' correction

\*\* Fisher's exact test, 2-tailed

The raw P-value was adjusted for testing of 9 hypotheses (P') according to the Ryan-Holm step-down Bonferroni procedure

**Table 2.** Criteria for the diagnosis of the oral lesions found in patients and control group.

<b>Oral lesion</b>	<b>Characterization</b>
<b>Fissured tongue</b>	Diagnosis based on the presence of anteroposteriorly oriented fissures usually with several branches extending laterally (6).
<b>Geographic tongue</b>	Seen on the anterior two-thirds of the dorsal tongue mucosa, with well-demarcated zones of erythema. This erythema is due to atrophy of filiform papillae, surrounded at least partially by a slightly elevated, yellowish-white, serpiginous border (6).
<b>Denture stomatitis</b>	Presents varying degrees of erythema, sometimes accompanied by petechial hemorrhage, localized to the denture-bearing areas, rarely symptomatic (14).
<b>Angular cheilitis</b>	Localized in angles of the mouth, characterized clinically by erythema, fissuring and scaling with or without ulceration, and could be accompanied by subjective symptoms of soreness, tenderness, burning or pain (13).
<b>Actinic cheilitis</b>	Premalignant alteration of the lower lip characterized by vermilion atrophy with mixed areas of pallor and erythema along with the disappearance of the demarcation line between the vermilion and the skin (12).
<b>Oral lichen planus</b>	Interlacing white lines also referred to as Wickham's striae, developing on a slightly erythematous, or normal appearing mucosa (11).
<b>Traumatic keratosis</b>	Diffuse keratotic patches with poorly defined margins associated with low-grade trauma such as teeth, dentures, and cheek biting (5).
<b>Fibroma</b>	Smooth-surfaced pink nodule that is similar in color to the surrounding mucosa. The labial mucosa, tongue and gingival are also common sites (13).
<b>Haemangioma</b>	Benign proliferation of blood vessels. Typically, a soft, moderately well-circumscribed, painless mass, with red or blue color (13).

**Table 3.** Frequency of fissured tongue (FT) and geographic tongue (GT) in the different forms of psoriasis (n = 166).

Oral lesions	Localized psoriasis (53.6%) (n = 89)			Generalized psoriasis (46.4%) (n = 77)			
	Localized plaque	Inverse	Plaque-pustular	Generalized plaque	Guttate	Generalized pustular	Erythrodermic
*FT	32.1% (25/78)	33.3% (1/3)	50.0% (4/8)	36.1% (13/36)	37.5% (3/8)	33.3% (4/12)	33.3% (7/21)
**GT	19.2% (15/78)	0.0% (0/3)	25.0% (2/8)	19.4% (7/36)	0.0% (0/8)	33.3% (4/12)	9.5% (2/21)

n = number of patients

\*nonsignificant: chi-square with Yates' correction = 0.00; p = 0.984

\*\*nonsignificant: chi-square with Yates' correction = 0.03; p = 0.866

The question was posed as to whether either FT or GT was more strongly associated with the generalized as opposed to localized forms. When the frequency of FT concomitant with any generalized form was compared to its frequency with any localized form there was no statistical difference (p=0.984). The same analysis carried out for GT in relation to generalized and localized forms likewise yielded no statistical difference (p=0.866). Of note, GT was not found in any patients with the inverse, plaque pustular or guttate forms of psoriasis (Table 3).

### Discussion

In this study, patients with psoriasis did not present any type of oral lesion not found in the control group, or, broadly speaking, in the general population. From this investigation, 2 types of lesions were found to be statistically more prevalent in the patients with psoriasis than in the control group, namely fissured tongue (FT) and geographic tongue (GT). The percentage of FT found in our patients with psoriasis was 34.3%, which is much higher than the 5 to 14.3% reported in previous studies (2,8,15,16). The significance of these frequencies in patients with psoriasis was not established by those authors since their studies did not involve control groups for comparative analyses. It seems, however, that the percentages of FT reported in those articles are within the normal range found in the majority of surveys involving the general population (17-20). In two controlled studies for which the frequency of tongue lesions in psoriasis was determined (21,22), the percentage for FT in psoriatic patients was 16.7% and 33%, respectively; although only the latter (which was similar to the 34.3% found in the present study) was statistically significant. In terms of age-range comparisons, our data showed a statistically significant higher occurrence of FT in patients with psoriasis over 21 years old as well as a trend to occur more often in the older subjects of the control

group. These findings are in accordance with the results of other studies (6,19,20).

No other factors evaluated in this study, such as systemic medication and/or topical treatment for psoriasis or forms of this disease, produced any statistically significant increase of the frequency of FT or GT in patients with psoriasis.

In terms of any etiological association between FT and psoriatic patients, some reports have suggested that FT (along with GT) and generalized pustular psoriasis are genetically linked diseases (23,24). Another report (25) considered FT as a fairly constant mucosal change in generalized pustular psoriasis, although only this form of psoriasis was investigated by that author. In a study of 6 cases of oral psoriasis, in which 4 had FT and/or GT, Uimansky et al. (9) linked both diseases as oral expressions of psoriasis. In the present study, the higher prevalence of FT in patients with psoriasis suggests that this lesion is an oral manifestation of psoriasis. Any conclusion in this respect, however, must take into account that the link between these two diseases is still unproven, and, moreover, that FT is a feature also common to insulin-dependent diabetes mellitus (26), Down's syndrome (27), and Melkersson-Rosenthal syndrome (28). FT is considered to be a genetically inherited trait (6,23). This suggests that the frequent occurrence of FT in psoriasis may result from a shared genetic basis, an interaction between two separate genetically based etiologic processes, or a combination of genetic and pathophysiologic interaction. The other lesion found to be more prevalent to a significant degree in patients with psoriasis was GT, which has gained the attention of many investigators on the subject of oral psoriasis. GT and its counterpart non-lingual, geographic stomatitis, have been considered as an oral manifestation of psoriasis by many authors (3,7,9,15,21,29). Some authors have also suggested that geographic tongue and generalized pustular psoriasis

are genetically related diseases (23,24). The characterization of GT and/or geographic stomatitis as a psoriasiform lesion has been mostly based on the claim that these lesions occur more frequently in patients with psoriasis than without, and may exhibit histologic features similar to psoriatic lesions. This characterization, however, has been subject to controversy. One argument is that there is no consensus that the frequency of GT is in fact higher in patients with psoriasis than without. The reported prevalence of GT in patients with psoriasis has varied from 1 to 5.7% (2,8,15,16) which is within the normal range found in the general population. In only 2 previous studies (21,22) was GT found to be statistically more prevalent in psoriasis than in a control group. The prevalence of geographic stomatitis has also varied in surveys with psoriatic patients, from 0 to 19% (2,15,21); however, the frequency of this lesion in the general population is not known. In the present investigation no case of geographic stomatitis was detected in either the patients or the control group. Some authors, while not denying that both GT and geographic stomatitis present similarities with skin psoriasis, do not see these similarities as a reason to consider these oral lesions as manifestations of psoriasis (1,2,5). As we were finishing this manuscript, a recent article on oral psoriasis came to our attention (30), whose data, like those of the present study, demonstrated that FT and GT were most prevalent oral lesions associated with cutaneous psoriasis.

## Conclusion

Psoriatic patients presented no specific oral lesion different from those seen in the control group. FT and GT were not characterized as true oral manifestations of cutaneous psoriasis. Indeed, at present there is no consensus in regard to how this characterization could even be established. In a strictly statistical finding, FT and GT were seen to occur with greater prevalence in patients with psoriasis than in the control group. They were, furthermore, the only types of oral lesions to present a statistical correlation with skin psoriasis.

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