

## Prevalence of oral lesions in patients with psoriasis

Francisco Hernández Pérez <sup>1</sup>, Alejandra Jaimes Aveldañez <sup>1</sup>, Ma. de Lourdes Urquizo Ruvalcaba <sup>1</sup>, Moises Díaz Barcelot <sup>1</sup>, Maria Esther Irigoyen Camacho <sup>2</sup>, Ma. Elisa Vega Memije <sup>3</sup>, Adalberto Mosqueda Taylor <sup>2</sup>

(1) DDS, Oral Pathology and Oral Medicine Specialization, Health Care Department, Universidad Autónoma Metropolitana, Xochimilco

(2) Professor, Health Care Department, Universidad Autónoma Metropolitana-Xochimilco

(3) MD, Department of Dermatology, Hospital General "Dr. Manuel Gea González", México, D.F.

### Correspondence:

Dr. Francisco Hernández Pérez

Calle Sabinos 4121

Col. Del Gas

Azcapotzalco, D.F. 02950

E-mail: pakohdez@prodigy.net.mx

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### Abstract

**Aim:** To determine the prevalence of oral lesions (OL) in patients with psoriasis, and compare these findings with the ones found in patients without this condition.

**Materials and methods:** In the present observational and comparative study, we evaluated 207 patients, with and without psoriasis, attending the dermatological consulting service of a concentration hospital in Mexico City. The possible association between OL and psoriasis was analyzed through a logistic regression model; the Odds Ratio (OR) and its Confidence Interval (CI) was calculated to be 95%.

**Results:** Two hundred and seven cases were examined (80 with psoriasis and 127 without psoriasis). Of these, 75 (36.2%) were men and 132 (63.7%) women. Oral lesions were found in 54 (67.5%) psoriatic patients and in 63 (49.6%) of the comparative group ( $p < 0.012$ ). Fissured tongue (FT) was present in 47.5 % of the patients with psoriasis and in 20.4 % of the group without psoriasis, (OR=3.46, 95% CI [1.14, 10.5],  $p=0.001$ ). Geographic tongue (GT) was present in 12.5 % of the group with psoriasis and 4.7 % in the group without this disease (OR=3.54 95 % CI [1.97, 6.79],  $p=0.028$ ). Likewise, six patients (7.5 %) with psoriasis and 3 (2.36 %) from the comparative group presented simultaneously GT and FT ( $p = 0.0776$ ). The most frequent type of psoriasis was the vulgar psoriasis (90 %), in which a higher prevalence of FT ( $p < 0.05$ ) was present. There were no differences between both groups ( $p > 0.05$ ) regarding the use of tobacco. Alcohol consumption was greater (55.0%) among patients with psoriasis than among those without psoriasis (26.7%) ( $p < 0.05$ ), but when the association with GT and FT was analyzed, no significant differences were found among consumers and not consumers of tobacco and alcohol ( $p > 0.05$ ).

**Conclusions:** The high prevalence of GT and FT in patients with psoriasis suggests that these lesions should be taken into account in new studies as possible predictors or markers of the severity of this dermatosis, in order to confirm the association of these entities.

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

## Introduction

Psoriasis is a common disease of the skin that affects women and men equally and it is more common in Caucasian population (1). In Mexico, it represents 2 % of the dermatological consultation and in almost 50 % of the cases develops after the second decade of life (2). The etiology of this dermatological problem is multifactorial, but it has a strong hereditary component and it has been related to certain trigger factors such as streptococcal infections, tobacco smoking, alcohol consumption, stress, obesity, as well as certain drugs as beta-blockers, lithium carbonate, non-steroidal anti-inflammatory agents, systemic corticosteroids and other therapeutic agents (1).

The presence of specific oral manifestations in psoriasis has been questioned. The problem in accepting the diagnosis of psoriasis in the oral mucosa is originated on the fact that a histological distinction between psoriasis and some common inflammatory entities of the oral mucosa cannot be made. These entities, such as geographic tongue and benign migratory stomatitis, usually appear without an apparent association to the cutaneous disease, although they also have been described as being coincident with it (2,3).

The aim of the present study was to compare the prevalence of different oral mucosa lesions in patients with a confirmed diagnosis of psoriasis and in a group of individuals without this dermatological alteration, in order to determine if any of these lesions is associated to this dermatosis.

## Patients and Methods

The studied population included 207 patients distributed in two groups; the first one was composed by 80 patients with a confirmed diagnosis of psoriasis, and the second group by 127 patients with onychomycosis, with no evidences of psoriasis. These patients were attended in the outpatient service of the Department of Dermatology at the Hospital General "Dr. Manuel Gea González" of Mexico City, during the period 2006 - 2007.

We collected information regarding demographic data, clinical characteristics of the disease, tobacco and alcohol consumption, drug ingestion and the results of the examination of the oral cavity. This was done putting special attention to the identification of those lesions that, according to the literature, are possibly associated to psoriasis: geographic tongue (GT), fissured tongue (FT), angular cheilitis (AC) and erythema migrans (EM), as well as other entities apparently not associated to this dermatosis. The clinical oral examination was carried out, and during the intra and inter-examiner calibration, a percentage of agreement higher than 90 % of uniformity in the criteria of diagnosis was obtained. The Ethics and Research Committee of Hospital General "Dr. Manuel Gea Gonzalez" approved the protocol of this work after considering the ethical aspects of the investigation.

The inclusion criteria considered only patients with a diagnosis of psoriasis and onychomycosis, between 20 - 80 years-old, of both genders, with a current clinical record in the institution, and who consent to participate in the study and signed the informed consent forms. The percentage of patients who did not agree to take part in the study was 3.7%. The exclusion criteria considered patients with no definitive diagnosis of psoriasis or onychomycosis, patients with psoriasis that were hospitalized and patients that did not have a clinical file at the institution. The elimination criteria were the patients who, in the course of the study drop their treatment; patients who, at the moment of initiating the study, presented complications of a pathological process or another condition which could impede carrying out adequately the oral examination, and those who did not agree to undergo complementary studies such as smear, physical exploration, comprehensive examination or nail direct examination. The questions about the tobacco smoking habits included the following ones: if the person was currently smoking, number of years smoking and number of cigarettes per day. In the case of former smokers, the questions were directed towards the number of years they smoked, and the mean number of cigarettes they usually smoked per day. Using this information, and in accordance with the National Cancer Institute criteria (4), the variable package-years was constructed; this is the result of the number of smoking years multiplied by the number of daily cigarettes divided by 20 (total of cigarettes contained in a package).

Media and standard deviations ( $\pm$ ) of the continuous variables were calculated; the nominal variables showed the ratios and their corresponding frequency distribution. In order to establish the association between the presence of oral lesions in patients with psoriasis and those who did not suffer from this dermatosis, the Odds Ratio (OR) and its 95% Confidence Interval (CI) were calculated through a logistic regression model. Likewise, possible confounding or effect modifier variables were included in the model such as tobacco, alcoholism, age and gender. The JMP Package was used to carry out the statistical analysis.

## Results

A hundred thirty two women and 75 men with an average age of 49 years ( $\pm 15.8$ ), and a range of 15 to 83 years old, were examined. The average age of the 80 patients diagnosed with psoriasis was 51 years ( $\pm 15.2$ ), whereas the one of the 127 individuals without psoriasis was 49 years ( $\pm 15.8$ ) ( $p > 0.05$ ).

Oral mucosal lesions were detected in 117 (56.5%) individuals. It was observed that psoriatic patients presented a smaller proportion of OL ( $p = 0.0114$ ). Fissured tongue (FT) was detected in 30.9% of the participants and geographic tongue (GT) in 7.7% ( $p < 0.05$ ). Table I shows the prevalence of FT and GT in the groups with and without psoriasis. It was noticed that the prevalence of both was

**Table 1.** Geographic and fissured tongue prevalence among patients with and without psoriasis.

Group	With psoriasis n = 80		Without psoriasis n = 127		P
	No.	(%)	No.	(%)	
With Fissured tongue	38	(47.5)	26	(20.4)	< 0.0001
With Geographic tongue	10	(12.5)	6	(4.7)	0.0447
Simultaneous presence of fissured tongue and geographic tongue	6	(7.5)	3	(2.36)	0.0776

**Table 2.** Prevalence of other oral mucosa lesions in patients with and without psoriasis.

Lesions	With psoriasis n=80		Without psoriasis n=127		Total n=207	
	No.	%	No.	%	No.	%
Leukoedema	9	(11.3)	5	(4)	14	(6.8)
Erythematous Candidiasis	6	(7.5)	8	(6.3)	14	(6.8)
Non-gingival melanin pigmentation	8	(10)	3	(2.4)	11	(5.3)
Gingival melanin pigmentation	5	(6.2)	5	(4)	10	(4.8)
Fordyce condition	3	(3.7)	5	(4)	8	(3.9)
Frictional keratosis	4	(5)	4	(3.2)	8	(3.9)
Ulcers with apparent cause (traumatic)	2	(2.50)	4	(3.1)	6	(2.8)
Focal pigmentation	1	(1.2)	2	(0.8)	3	(1.4)
Morsicatio buccarum	0		3	(2.4)	3	(1.4)
Smoker's palate	0		1	(0.7)	1	(0.4)
Pseudomembranous candidosis	1	(1.2)	0		1	(0.4)

greater in the group that suffered psoriasis; likewise, it was detected that almost half of the individuals with psoriasis presented fissured tongue, whereas only a fifth part of the patients without psoriasis had this oral alteration ( $p < 0.001$ ). GT had a low prevalence in both groups, but it was greater in the group with psoriasis ( $p < 0.05$ ). Four individuals (1.9%) presented angular cheilitis (AC), three of them were in the group with psoriasis (3.7%) and one in the comparative group (0.7%). There were no cases of erythema migrans.

Regarding the psoriasis type, it was observed that the vulgar psoriasis occurred in 72 patients (90.0%), psoriasis guttata in two (2.5%) psoriatic erythroderma and generalized pustular psoriasis in one patient (1.2%) respectively, pustular psoriasis in four patients (5.0%) and no one had annular psoriasis. Among the patients with vulgar psoriasis 11.1% presented GT, and among the patients with another types of psoriasis 25% had GT. FT was detected in 48.6% of the patients with vulgar psoriasis and in 37.5% of the patients with other types of psoriasis. There was no association between the type of psoriasis and the presence

of GT and FT ( $p > 0.05$ ).

According to the age of psoriasis onset, the individuals were classified as having early psoriasis (starting before or equal the age of 40) and late psoriasis (after the age of 40); most of the individuals (71.2%) had late psoriasis. A greater proportion of FT was detected in individuals with late psoriasis (31 cases, 54.4%) and only seven cases (30.4%) occurred in the early stage ( $p < 0.05$ ). Regarding GT, there were no significant differences.

The study group was composed by 57 active smokers (27.5%) and 27 former smokers (13%), and therefore those that sometime had this addiction represented 40.5%. Within the group of patients with psoriasis, 30% currently smoke and in the group without psoriasis, 25.9% does ( $p > 0.05$ ). The average of smoked packets per year in the group of study was 7.7 ( $\pm 11.4$ ). The average was 8.4 ( $\pm 11.5$ ) in patients with psoriasis and 6.9 ( $\pm 11.3$ ) in the patients without this alteration ( $p > 0.05$ ). Regarding alcohol consumption in the whole group of individuals, 78 (37.6%) stated to consume alcohol, and the rate of alcohol consumption in patients with psoriasis was signi-

ificantly greater (55.0 %) than those that did not have this alteration (26.7 %) ( $p < 0.05$ ). Likewise, it was found that patients with psoriasis consume more units of alcohol than patients without psoriasis. A consumption of more than ten daily units was observed in 13 patients with psoriasis (16.2 %), while this was the case in only eight (6.3 %) patients without this dermatosis ( $p < 0.05$ ).

The logistic regression model for FT showed an association between psoriasis and this oral lesion (OR=3.46, 95 % CI [1.14, 10.5],  $p=0.001$ ), adjusted to gender, age, use of tobacco and alcohol variables, which were not significant in the model. Likewise, a model for GT and psoriasis was created (OR=3.54 95% IC [1.97, 6.79],  $p=0.028$ ), and it was observed that the greater the age the higher the prevalence of GT ( $p=0.024$ ); as well as in the case of FT, gender, smoking and drinking alcohol were not significant factors.

Table 2 shows the prevalence of those oral lesions (OL) apparently not associated to psoriasis. In general, it was shown that the most frequent condition was leukoedema, followed by erythematous candidiasis and physiological melanin pigmentation. The leukoedema and the physiological melanin pigmentation were more frequent in the individuals with psoriasis. A significant difference was detected in the prevalence of the evaluated OL between both groups ( $p < 0.05$ ).

It was found that four patients with psoriasis were consuming angiotensin-converting enzyme inhibitors, three were using non-steroidal anti-inflammatory drugs and two patients were consuming beta-blockers; there was not evidence of an association between the consumption of these drugs and psoriasis, and the occurrence of potentially drug-induced oral lesions.

## Discussion

The existence of oral mucosa alterations in patients with psoriasis is a controversial topic; while some authors accept the existence of oral lesions as manifestation of psoriasis based on histopathological similarities between them, others claim that oral lesions need to follow a parallel course to the cutaneous disease in order to accept them as the same entity. The present study analyzed the prevalence of OL in patients with psoriasis and patients without it and particularly the association of this dermatosis to GT, FT, EM and AC, as these have been found frequently in patients affected with this dermatosis and the literature refers to them as possible oral manifestations of this disease (5-12); however, the literature is not consistent regarding this association, so it is necessary to compare the incidence of these lesions in patients with and without psoriasis.

Our study found that patients with psoriasis presented a higher prevalence of FT and GT, than those without this dermatological disorder. Similarly, the studies carried out by Morris, et al. (11), Buchner and Begleiter (13), Brice, et al. (5) and Bruce and Rogers (14), found that the frequency

of GT and FT is high in patients with psoriasis. Besides these two lesions, Hietanen et al. (9) reported the presence of AC in 3.5 % of the patients with psoriasis; nevertheless, epidemiological studies indicate that the latter is observed in similar percentage in normal population (3.8 %) (15), since it is a condition of variable etiology (full denture irritation, iron or B complex deficiencies, candidiasis, etc). In turn, Pogrel, et al. (10) found AC in 7 % and EM in 19 % of the patients with psoriasis. Our study found only three cases of AC (3.75 %) and no EM cases, probably because most of the patients were going through a chronic phase of psoriasis. The reason for the high frequency of EM observed by Pogrel, et al. (10), could be that the 100 patients in their study were dealing with an acute exacerbation of psoriasis; the authors suggest that these patients develop more oral manifestations than the patients with a chronic course of the disease. They also found a high incidence of HLA-DR7 in patients with psoriasis and EM, a finding that has not been explored in our population yet.

In recent studies Daneshpazhooh, et al. (16), showed that FT occurred in 33 % of the patients with psoriasis, and GT in 14 % of them. In the same way, Hietanen, et al. (9) observed that FT (9.5 %) was more frequent than GT (1 %), which coincides with the findings of Pogrel, et al. (10), who found FT in 7 % and GT in 5 % of patients with psoriasis. These findings are similar to our results, where we detected a greater frequency of FT than GT. Ulmansky, et al. (7), suggested that GT is a transitory expression of psoriasis, while FT is a late and permanent expression. This could explain the greater frequency of FT observed in our patients, since more than 70 % of those affected by psoriasis were diagnosed in adult age, and it would also explain the frequent coexistence of both entities (FT and GT) noticed in several cases.

As in our study, Daneshpazhooh, et al. (16) found that the most frequent type of psoriasis in their series was the vulgar psoriasis (90.5 % and 70 %, respectively). Nevertheless, these authors observed that FT appeared with higher frequency in generalized pustular psoriasis (53.8 %) and psoriatic erythroderma (30.4 %), whereas in our study FT was more frequent in vulgar psoriasis (48.6 %). However, the analysis of the frequency of GT and FT by psoriasis type was limited in the present work due to the small number of cases included in the diverse clinical variants of psoriasis.

This study showed that the consumption of alcohol was higher in patients with psoriasis; however, the reason for this is unknown. Follow-up studies are required in order to identify the effect of alcohol in patients with psoriasis and determine if there is an etiological association or if alcohol consumption could be related to emotional and social situations secondary to the presence of the cutaneous disease.

In 2006, Shulman, et al. (17) reported that 15 % of the patients with FT were also presenting GT. Nevertheless,

we observed that only 4.3 % of the patients with FT had also GT. Another finding these authors reported was that GT was less frequently seen in smokers, but our analysis did not find this association. Zargari (18) found that GT had a low prevalence in smokers, suggesting that, as in recurrent aphthous stomatitis cases, tobacco might induce a protective effect in the development of psoriatic lesions, as there are evidences that tobacco produces certain cytological changes in the oral mucosal epithelium, such as a higher cell proliferation index and keratinization that arise to protect the organism from the aggressive agents caused by the direct exposure to the heat of the cigarette and the chemical action of the volatile products of tobacco (19, 20).

Luzoro et al. (21) reported that some drugs, such as beta-blockers, lithium carbonate, non-steroidal anti-inflammatory agents and systemic corticosteroids are considered to be trigger or exacerbating factors of the psoriatic lesions; however, due to the small number of patients included in our study, it was not possible to confirm this in patients that were consuming these drugs.

There is evidence of an association among HLA-Cw6, psoriasis and GT (16,22), and it also has been suggested that GT, FT and generalized pustular psoriasis have hereditary polygenetic patterns, and that the affected patients can share some common genes (23-25). Likewise, Dawson (26) suggest the possibility of a genetic link among psoriasis, GT and FT. In this sense, Eidelman, et al. (27), investigated the possible family nature of GT and FT, and found that 48.8 % of the children with GT had FT and that the prevalence of GT and FT among siblings of the cases with one condition or the other was higher than in the control group. Therefore, they suggest that both conditions are hereditary with a polygenetic transmission way and that they can share some common genes, which can explain the association between GT and FT. On the other hand, the development of FT from GT has been reported (23), which in certain way could explain its higher prevalence in these patients, just as we think it might happened in our group. The association between both entities could be explained, at least partially, through the histopathological picture, since GT presents edema and acute inflammatory infiltrated in the epithelium and mixed in the lamina propria, which could cause tissue destruction and subsequent scar changes (23).

The present study showed an association among the presence of FT (OR=3.46), GT (OR=3.54) and psoriasis and this association still remains after adjustment of age, gender, alcohol and tobacco variables. The reason for this association is not clear; it is possible that the patients with psoriasis share a susceptibility to this type of lesions. We need more studies that include a follow-up of the psoriatic patients for a better understanding of the association of this dermatosis with the presence of oral alterations.

We conclude that GT and FT have not been clearly

identified as definitive oral manifestations of psoriasis. Although these lesions present histopathological similarities with psoriasis, it has not been recognized a parallel course to the dermatological manifestations of the disease. This and other works have reported a higher prevalence of these entities in psoriatic patients than in the population that is not affected by this dermatosis. This suggests that there is an association among them; nevertheless, cohort, HLA classification and genetics studies, among others, are required to produce enough information in order to draw valid conclusions about the above-mentioned association and determine if these lesions can indicate or predict the severity of the disease. Likewise, the high frequency of FT detected in our study, supports the results observed by other authors, who suggest that this entity can be a consequence of GT.

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