

PARTICULAR ASPECTS OF THE ORAL MUCOSA AS PREDICTIVE FACTORS FOR THE EVOLUTION OF PSORIASIS

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ABSTRACT

Aim of the study: Psoriasis is a chronic, immune-mediated inflammatory disease primarily affecting the skin, but it can also involve the oral mucosa. Emerging evidence suggests that oral manifestations might serve as early indicators or predictive factors for psoriasis evolution. This study aims to identify specific oral mucosal features that could predict the progression and severity of psoriasis, providing insights into early diagnosis and management strategies. **Materials and methods:** This prospective cohort study included 150 patients with clinically and histologically confirmed psoriasis manifesting oral lesions. The exclusion criteria included other systemic inflammatory diseases, recent use of systemic immunosuppressive therapy, and inability to provide informed consent. **Results:** The presence of oral changes such as fissures can be directly related to patients' gender. The presence of erythema and fissures on the oral mucosa can be correlated with the severity of psoriasis disease. **Conclusions:** Particular aspects of the oral mucosa, including erythema, plaques, and fissures, are significant predictive factors for the evolution of psoriasis.

Key words: psoriasis severity, psoriasis evolution, oral mucosal lesions, quality of life

INTRODUCTION

Psoriasis is a chronic inflammatory skin disease characterized by hyperproliferation of keratinocytes and an inflammatory infiltrate comprising T-cells, dendritic cells, and other immune cells. While the cutaneous manifestations of psoriasis are well-recognized, its effects on oral mucosa are less commonly discussed in the literature. This review aims to elucidate the particular aspects of oral mucosa involvement in psoriasis, highlighting the clinical manifestations, pathophysiology, diagnostic challenges, potential therapeutic approaches, and the

prognosis of the evolution of psoriasis with oral manifestations. [1-5]

Psoriasis affects approximately 2-3% of the global population and is characterized by hyperproliferation and abnormal differentiation of keratinocytes, along with chronic inflammation. [2-7] While skin involvement is well-documented, oral manifestations are less commonly recognized. Understanding the oral mucosal changes in psoriasis can aid in early detection and potentially predict disease progression. This study explores the particular aspects of the oral mucosa that may serve as predictive factors for

the evolution of psoriasis.

MATERIALS AND METHODS

Study Design and Participants

This prospective cohort study included 150 patients with clinically and histologically confirmed psoriasis, recruited from a total of 1,854 psoriatic patients, aged 1 to 94 years, from St. Spiridon Hospital in Iași, Romania. These patients were admitted to the dermatology clinic, oral surgery clinic, and plastic surgery clinic between July 2007 and December 2023. The inclusion criteria were patients with histopathologically confirmed psoriasis manifesting oral lesions. The exclusion criteria included other systemic inflammatory diseases, recent use of systemic immunosuppressive therapy, and inability to provide informed consent.

Data Collection

Participants underwent comprehensive oral examinations by a trained oral pathologist. Data on demographic variables, psoriasis history, and clinical features were collected. Oral mucosal changes were documented, including the presence of erythema, plaques, ulcers, fissures, and desquamation.

Assessment of Psoriasis Severity

Based on the presence of erythema, plaques, ulcers, fissures, and desquamation, the severity of the disease was calculated. Psoriasis severity was evaluated using the Psoriasis Area and Severity Index (PASI) at

baseline and every six months for two years. Changes in PASI scores were used to assess disease progression. The PASI scores are ranged between 0 and 72. The severity of the disease was assessed based on the obtained scores, as values between 0 and 10 are considered mild cases, 11-20 moderate severity and scores >20 are severe.

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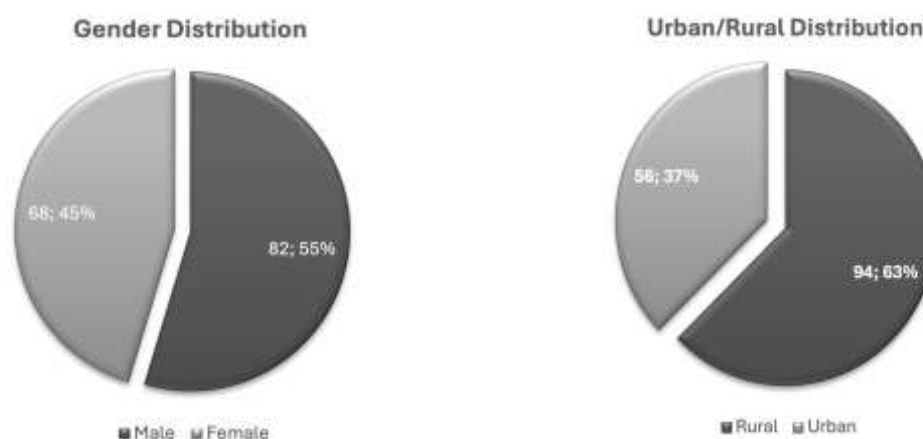
Statistical Analysis

Data were analyzed using SPSS software version 29.0.0. Descriptive statistics summarized demographic and clinical characteristics. The correlation between oral mucosal findings and changes in PASI scores was assessed using Pearson's correlation and regression analysis. A p-value <0.05 was considered statistically significant.

RESULTS

Demographic and Clinical Characteristics

The study cohort comprised 82 males and 68 females, with a mean age of 52.43 ± 15.62 years, of which 94 patients originated from rural areas and 56 from urban areas. The mean duration of psoriasis was 10.39 ± 5.66 years. The demographical characteristics of the studied population are presented in figure 1.



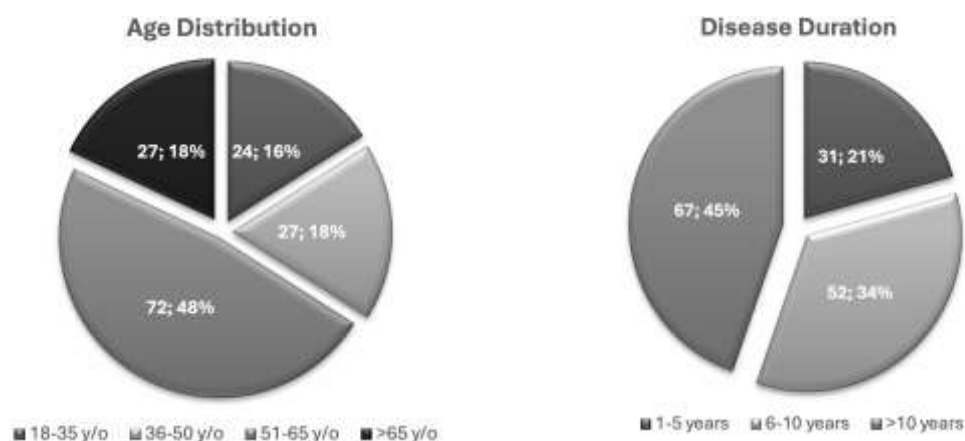


Figure 1. Demographic characteristics of the studied population

Oral mucosal changes were observed in 67.33% of the patients, with erythema (45.33%), plaques (30.33%), and fissures

(21.33%) being the most common findings. The oral mucosal changes distribution is presented in figure 2.

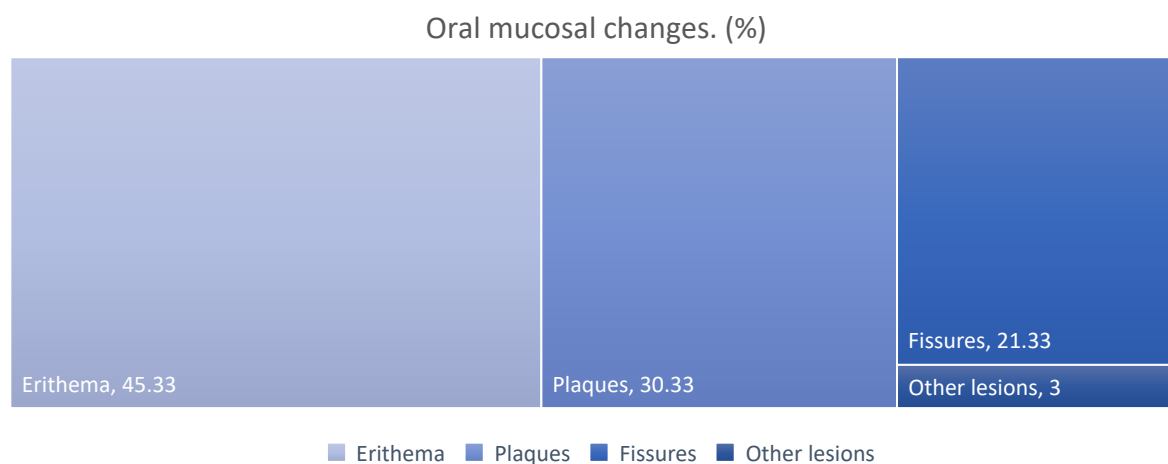


Figure 2. The oral mucosal changes distribution

Predictive Value of Oral Mucosal Changes
The PASI scores were assessed for 5 times, at the initial time and at each 6 months, for 2

years. The obtained values are presented in table 1.

Table 1. Mean PASI scores after each 6 months evaluation

Severity	Evaluation 1 (initial)	Evaluation 2 (6 months)	Evaluation 3 (12 months)	Evaluation 4 (18 months)	Evaluation 5 (24 months)
No. of cases / Percentage (%)					
Mild Scores 1-9	107 / 72%	104 / 69.33%	107 / 71.33%	101 / 67.33%	96 / 64%
Moderate	35 / 23.33%	39 / 26%	37 / 24.66%	43 / 28,66%	47 / 31.33%

Scores 10-19					
Severe	7 / 4.66%	7 / 4.66%	6 / 4%	6 / 4%	7 / 4.66%
Scores ≥ 20					

The correlation analysis showed that the presence of the erythema can be statistically correlated with the mean PASI scores after two years with a Pearson test value of 28.128 and a significance of $p=0.042$. In addition, the presence of plaques on oral mucosa could also be correlated with the PASI scores recorded after two years with a Pearson Chi-square test value of 29.404 and a significance of 0.015.

Furthermore, the statistical analysis using Fisher's test showed that the presence of fissures on the oral mucosa could be correlated with the patients' gender ($p=0.042$).

Regression analysis showed that the presence of oral mucosal changes could predict an increase in PASI scores, accounting for 63% of the variance with a R^2 value of 0.635 and a significance of $p<0.01$ (Figure 3).

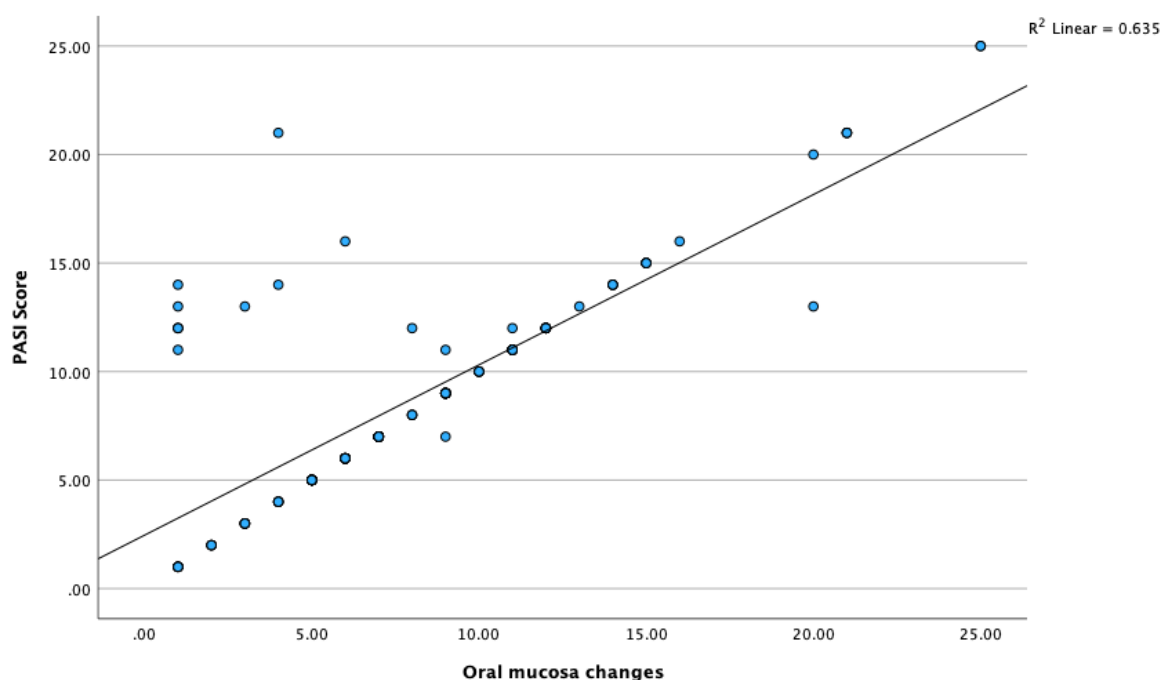


Figure 3. Liner Regression Analysis

DISCUSSIONS

Psoriasis is a chronic inflammatory condition primarily affecting the skin, but its impact extends beyond the cutaneous manifestations. Oral mucosa involvement in psoriasis, though less frequently discussed, significantly affects patients' quality of life (QoL). This original article aims to explore the impact of oral psoriasis on QoL, the specific

challenges faced by these patients, and the potential interventions to mitigate these effects.

The findings suggest that specific oral mucosal changes, particularly erythema, plaques, and fissures, can serve as predictive factors for the evolution of psoriasis. These changes might reflect systemic inflammatory activity and could be used to identify patients

at risk for more severe disease progression. The study highlights the importance of regular oral examinations in patients with psoriasis for early detection and management of potential exacerbations.

Oral manifestations in psoriasis can present with a variety of lesions, often resembling other conditions such as lichen planus or candidiasis, which complicates diagnosis. [5-11] The most common oral manifestations include: *erythematous lesions* (patches on the mucosal surfaces, often well-demarcated and located on the tongue, buccal mucosa, and palate), *white plaques* (similar to cutaneous psoriasis, these plaques may be less scaly and can appear anywhere in the oral cavity), *geographic tongue* (Benign Migratory Glossitis characterized by migratory, well-demarcated erythematous areas with white borders, often fluctuating over time, this condition is frequently associated with psoriasis), *fissured tongue* (deep grooves or fissures on the dorsal surface of the tongue, frequently associated with geographic tongue), *ulcerations* (painful ulcers, though less common, can significantly impair oral functions).

Patients with oral psoriasis may report a range of symptoms, including burning sensations, pain, and discomfort, especially when lesions are ulcerative. These symptoms can significantly impact oral functions such as eating, speaking, and swallowing, thereby affecting quality of life.

The pathophysiology of oral psoriasis is believed to parallel that of cutaneous psoriasis, involving a complex interplay between genetic predisposition, immune dysregulation, and environmental triggers. [5-16] The key pathophysiological aspects include: *genetic factors* (psoriasis is associated with several genetic loci, including HLA-Cw6, which are thought to contribute to susceptibility and clinical expression), *immune system dysregulation* (the central role of T-cells,

particularly Th1 and Th17 subsets, and cytokines such as TNF- α , IL-17, and IL-23, in driving the inflammatory process is well-established), *keratinocyte proliferation* (similar to skin psoriasis, oral mucosal lesions exhibit hyperproliferation and abnormal differentiation of keratinocytes), *microbiome alterations* (changes in the oral microbiome may also play a role, although this is an emerging area of research).

The impact on Quality of Life involves: physical discomfort and pain, psychological and emotional effects, functional limitations, social and occupational impact, [17-19]

Oral psoriasis can cause considerable physical discomfort, including burning sensations, pain, and ulcerative lesions. These symptoms can interfere with basic oral functions such as eating, drinking, speaking, and swallowing, leading to a compromised nutritional status and weight loss in severe cases.

The visibility of oral lesions can lead to self-consciousness and embarrassment, particularly during social interactions and professional settings. Patients may experience anxiety, depression, and social isolation, exacerbating the overall burden of the disease.

Oral psoriasis can impose functional limitations, including difficulties in chewing and swallowing, altered taste perception, and reduced oral intake. These limitations can impair daily activities and overall well-being.

The symptoms and visible lesions associated with oral psoriasis can adversely affect social interactions and professional life. Patients may avoid social gatherings and face challenges in job performance, leading to a diminished quality of life and increased socio-economic burden.

The assessment of Quality of Life includes the Patient-Reported Outcome Measures (PROMs)

PROMs are essential tools for assessing the QoL in patients with oral psoriasis.

Instruments such as the Oral Health Impact Profile (OHIP) and the Dermatology Life Quality Index (DLQI) are commonly used to evaluate the impact of oral lesions on daily life.

Comprehensive clinical evaluation, including the assessment of lesion severity, pain, and functional impairment, is crucial for understanding the full extent of QoL impact. Regular follow-ups and patient interviews help in monitoring disease progression and treatment efficacy.

Diagnosing oral psoriasis is challenging due to its clinical similarity to other oral conditions. Differential diagnosis includes: oral lichen planus (oth conditions can present with white plaques and erythematous lesions, but lichen planus typically has a reticular pattern), candidiasis (white plaques in candidiasis are usually removable and may be accompanied by a burning sensation), lupus erythematosus (can also present with erythematous and ulcerative lesions but typically has additional systemic manifestations).

Histopathological examination and direct immunofluorescence studies are often required for definitive diagnosis. Histologically, oral psoriasis shows parakeratosis, elongated rete ridges, and a mixed inflammatory infiltrate, which can help distinguish it from other conditions.

Oral mucosa lesions may precede or accompany cutaneous manifestations, potentially serving as early indicators of systemic involvement. Patients presenting with oral lesions may be at higher risk of developing more severe or widespread psoriasis, including psoriatic arthritis and other systemic complications. [7,20-22]

Several studies have suggested a correlation between the presence of oral lesions and the severity of cutaneous psoriasis. Patients with more extensive or severe oral lesions may have a higher Psoriasis Area and

Severity Index (PASI) score, indicating more aggressive disease. [19,22,23]

Oral lesions may reflect underlying systemic inflammation and immune dysregulation in psoriasis, making them valuable biomarkers for monitoring disease activity and treatment response. Regular assessment of oral lesions can provide insights into the effectiveness of systemic therapies and help guide treatment adjustments. [24-28]

Therapeutic Approaches

Management of oral psoriasis involves both systemic and local treatments [7,29,30]:

1. topical therapies: corticosteroids (can reduce inflammation and pain, improving QoL in patients with mild to moderate oral psoriasis), vitamin D analogs (can modulate keratinocyte proliferation and differentiation, providing relief from symptoms), and calcineurin inhibitors (tacrolimus and pimecrolimus are effective in reducing symptoms without the side effects associated with long-term steroid use) are commonly used to reduce inflammation and hyperproliferation.
2. systemic therapies: in cases with extensive or refractory oral involvement, systemic treatments such as systemic immunosuppressants (methotrexate and cyclosporine are used for severe cases of oral psoriasis, providing significant symptom relief and improving QoL), and biologics (targeting specific immune pathways, biologics such as TNF- α inhibitors, IL-17 inhibitors and IL-23 inhibitors can effectively manage refractory oral psoriasis) may be required.
3. phototherapy: narrowband UVB phototherapy has shown efficacy in cutaneous psoriasis and may have potential benefits for oral lesions, though clinical data is limited.

The supportive care of oral mucosa lesions in psoriasis involves: pain management (analgesics and anesthetic gels can alleviate pain, improving oral functions and QoL), nutritional support (dietary modifications and

nutritional supplements can help manage difficulties in eating and maintain nutritional status), psychosocial support (counseling and support groups can address the psychological and social challenges faced by patients, enhancing overall well-being).

Lifestyle modifications consist in: oral hygiene (maintaining good oral hygiene can prevent secondary infections and reduce discomfort), smoking cessation (smoking exacerbates psoriasis and quitting can improve symptoms and overall health), healing or managing coexistent oral conditions (like candidiasis), stress management (stress is a known trigger for psoriasis flares, and stress management techniques can help in reducing disease activity).

Oral mucosa lesions in psoriasis patients may serve as predictive factors for the

evolution and severity of the disease. Recognizing and addressing these lesions can provide valuable insights into disease progression, guide treatment decisions, and improve patient outcomes.

Oral involvement in psoriasis is an under-recognized but significant aspect of the disease that can affect patients' quality of life. Awareness of its clinical manifestations, pathophysiological mechanisms, and diagnostic challenges is essential for timely and accurate diagnosis. Tailored therapeutic approaches, incorporating both topical and systemic treatments, are necessary to manage this complex condition effectively. A comprehensive, multidisciplinary approach is essential for optimizing care and enhancing the quality of life for patients with psoriasis.

CONCLUSIONS

Particular aspects of the oral mucosa, including erythema, plaques, and fissures, are significant predictive factors for the evolution of psoriasis. The presence of erythema and fissures on the oral mucosa can be correlated with the severity of psoriasis disease. The presence of oral changes such as fissures can be directly related to patients' gender.

Recognizing these features can facilitate early intervention and potentially improve disease outcomes. Further research should focus on elucidating the underlying mechanisms linking oral and cutaneous manifestations of psoriasis and to develop targeted interventions that address both cutaneous and oral manifestations of this complex disease.

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Institutional Review Board Statement

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of Saint Spiridon Hospital, Decision no. 31334 from 02.08.2024.

Informed Consent Statement

Written informed consent for participation in the study, histopathologic preparation of the tissues and for publication of this paper was obtained from the patients or patient's parents.

Data Availability Statement

The data presented in this study are available on reasonable request from the corresponding

authors.

Conflicts of Interest

The authors declare no conflict of interest.

Author's contribution

The authors MP, AL, EPA, NM, and DEB had an equal scientific contribution to this research as GS, the first author.

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