

Original Article

Clinical effect of initial periodontal therapy combined with topical medication therapy on erosive oral lichen planus

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Abstract: Objective: To explore the clinical efficacy of initial periodontal therapy combined with topical medication blockage therapy in the treatment of erosive oral lichen planus (EOLP). Methods: A total of 60 cases of EOLP with chronic periodontitis patients in The First People's Hospital of Changzhou were selected as research subjects and randomly divided into two groups according to hospitalization sequence number. The control group was treated with topical medication therapy alone, and the experimental group was treated with topical medication therapy combined with initial periodontal therapy. The clinical symptoms, changes of physical signs, and changes of the oral mucosal erosion area before and after treatment of two groups of patients were observed after 1 month of treatment. Results: There was no significant difference in the scores of symptoms and physical signs before treatment between the two groups, and the size of the oral mucosal erosion area was also not statistically significant (all $P > 0.05$). The results of return visit after 1 month of treatment showed that improvement of symptom scores and sign scores of the experimental group were higher than those of the control group (both $P < 0.05$). The clinical effective rate and changes in the size of oral mucosal erosion area were also superior to those in the control group (both $P < 0.05$). Conclusion: Initial periodontal therapy combined with topical medication therapy can help to improve the therapeutic effect for patients with EOLP.

Keywords: Initial periodontal therapy, erosive oral lichen planus, chronic periodontitis, topical medication therapy

Introduction

Erosive oral lichen planus (EOLP) is a very common chronic inflammatory disease of the oral mucosa with an incidence of 0.5-2.2%. It is more common in people aged 30-60 years old, and occurs predominantly in females [1]. Oral lesions generally appear symmetrical, especially in molar area of the buccal mucosa where is the most common affected area. Other areas such as tongue, labial red part of the lower lip, and gingiva are also more common. The specific pathogenesis of EOLP is still unclear, and most of the current studies consider that EOLP is related to infection, endocrine, and local stimulation etc. [2]. Hyperemia, ulcers, and erosion of the oral mucosa have brought great pain to patients with EOLP, and these are accompanied by irritating pain and spontaneous pain. This disease is prone to relapse, and has a long resistance to treatment, seriously

affecting patients' quality of life [3]. The current clinical treatment of EOLP mainly includes topical/systemic corticosteroids, laser therapy, and surgical intervention. Through the above treatments, certain improvement of patients' mucosal skin color was achieved [4-6]. However, to reach a sustained clinical effect, steroid treatment alone is not enough [7, 8]. In addition, long-term hormone therapy might also bring patients numerous side effects. Therefore, comprehensive treatment measures should be taken for EOLP at present, which includes hormone therapy, initial periodontal therapy, and laser treatment. However, due to the immune mechanism of EOLP, current comprehensive treatment measures are all based on hormone therapy and impossible to get rid of the adverse reactions.

To this end, this research was conducted based on the topical use of hormones combined with

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Table 1. Comparison of clinical data between two groups of patients

	Case	Age (year)	Gender	
			Male	Female
Observation group	30	52.38±10.49	11	19
Control group	30	53.01±11.21	13	17
χ^2/t		0.225	0.278	
P		0.823	0.598	

initial periodontal therapy, in order to investigate the clinical significance of initial periodontal therapy in patients with EOLP.

Materials and methods

General information

In this study, a total of 60 patients treated in the Department of Stomatology of The First People's Hospital of Changzhou from May 2016 to May 2017 were selected as research subjects, who were clearly diagnosed in accordance with the World Health Organization's diagnostic standards on EOLP [9]. The research subjects were divided into an experimental group and a control group according to the random number method with 30 patients in each group.

Pathological diagnostic criteria were as follows: 1) The epithelial layer of oral mucosa was non-keratinizing or parakeratosis, mainly appeared with hyperacanthosis, and a few stratum spinosum atrophy; 2) Irregular extension of the protrusion of oral epithelium or serrated lower end; 3) Band-like infiltration of oral mucosa lamina propria lymphocyte, but the area was limited to the lamina propria; 4) Oral mucosa basal cells arranged disorderly, the liquefaction degeneration caused visible subepithelial blisters, and the membrane demarcation was unclear; 5) Visible round or oval-shaped colloid bodies were shown in each layer of oral mucosal.

Exclusion criteria: Smoker; age <16 years old; pregnancy and lactation; patients received topical and systemic steroid treatment in the past two months; patients with poorly controlled diabetes, hypertension, hepatitis C virus infection, and other patients who were not suitable for hormone and initial periodontal therapy.

All patients were informed about this research and signed the consent form. The Ethics Committee of The First People's Hospital of Changzhou approved this study.

Treatment methods

The treatment methods of the experimental group were as follows. (1) Initial periodontal therapy including: First, patients were taught about oral health related knowledge, and full-mouth supragingival scaling, subgingival scaling and root planing were performed to achieve the purpose of removing dental plaque and calculus.

Additionally, measures should be taken actively to eliminate plaque retention factors and other local irritation factors (dental calculus, inappropriate prosthesis, residual crown and root). At the same time, the patients were monitored to eliminate their own factors (such as smoking, etc.). (2) Local use of triamcinolone acetonide: triamcinolone acetonide (1 mL, 40 mg) and 2% of lidocaine (5 mL, 100 mg) were mixed in the proportion of 1:3 to formulate into 4 mL mixed solution (suspension), and was injected locally. Local blockade treatment was performed with multipoint injection at the bottom of mucosal lesion area (needle was inserted from the normal mucosa at the edge of the mucosal lesion, and injected in the submucosal of lesion area). The dosage of triamcinolone acetonide was 10-40 mg each time, and the dosage of hormone was mastered according to the area of mucous erosion of the patients (minimum dosage of 10 mg, up to 40 mg). The multipoint injection method was used for large area of lesions, which was administered once a week, and 4 times for a course of treatment. The curative effect was observed after two courses of treatment.

The treatment method of the control group: Triamcinolone acetonide was injected locally, and the injection method and dosage were the same as the experimental group.

Observation index

Mouthwash and antibiotics were not given to patients in both groups during the treatment and each patient was evaluated by two doctors. Subjective and objective observations were used to observe the changes in lesion areas of two groups of patients.

Subjective criteria: The visual analog scale method was conducted and divided into 10 grades: grade 0, the mildest and painless; grade 10, the heaviest and the most severe pain. The patients were self-assessed and recorded by doctors.

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Table 2. Comparison of symptoms and signs scores between two groups of patients before treatment

Symptoms score	Painless	Mild	Moderate	Severe	Total	Z	P
Observation group	3	14	10	3	30	4.521	0.210
Control group	1	8	16	5	30		
Signs score	0-1	2	4	5	Total	Z	P
Observation group	1	1	18	10	30	0.760	0.859
Control group	1	1	21	7	30		

Table 3. Analysis of clinical treatment outcomes of two groups of patients

	Case	Curative effect			Total effective rate (%)
		Markedly effective	Effective	Ineffective	
Observation group	30	17	8	5	83.33
Control group	30	15	9	6	80.00
χ^2/H			0.243		
P			0.886		

Table 4. Comparison of the pain degree between two groups of patients before and after pain treatment

	Case	Painless	Mild	Moderate	Severe	H	P
Observation group						15.058	0.002
Before treatment	30	3	14	10	3		
After treatment	30	15	11	3	1		
Control group						13.995	0.003
Before treatment	30	1	8	16	5		
After treatment	30	10	12	6	2		
H			2.377				
P			0.498*				

Note: Comparison of pain degree between the two groups after pain treatment, *P<0.05.

Objective index: the changes of mucosal erosion area, which was measured by observers.

Scoring standard: Internationally applied scoring standard were used to score signs and symptoms respectively. (1) Symptom score: The pain level is divided into four grades: severe (7-10 points); moderate (4-6 points); mild (1-3 points); painless (0 point). (2) Signs score is divided into 6 grades (0-5 points): 0 point, the lightest (mucosa normal, no damage); 5 points, the heaviest (white stripes erosion surface >1 cm²); 4 points, white stripes erosion surface <1 cm²; 3 points, white striped hyperemia or atrophy surface >1 cm²; 2 points, white stripes with hyperemia or atrophy surface <1 cm²; 1 point, minor white stripes, no hyperemia or erosion etc. [10].

Evaluation criteria: Markedly effective (signs scoring 0 or 1, symptom scoring 0); effective (signs and symptom scores decreased compared to the previous ones); ineffective (signs and symptom scores unchanged or increased compared with the previous ones). Total efficiency = ("markedly effective" number of cases + "effective" number of cases)/30 * 100%.

Statistical process

SPSS20.0 statistical software was used to analyze the normal measurement data of the two groups of patients with mean \pm standard deviation ($\bar{x} \pm sd$). The independent, normal, and homogeneous variance data between groups were compared using the paired t test. The sample rates were compared by Chi-square test or Fisher's exact probability method. Rank data was measured using rank sum test, and expressed by H. P<0.05 indicates that the difference is statistically significant.

Results

Clinical data

There was no statistical difference in age and gender between two groups of patients (both P>0.05), which was comparable as shown in **Table 1**.

Comparison of symptoms and signs score between two groups of patients

There was no statistical difference in the number of cases at each grade of pain level between two groups of patients (P>0.05). The result of cases number ratio of each level of symptoms in two groups of patients showed that signs scores of both groups of patients were no statistical difference (P>0.05) as shown in **Table 2**.

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Table 5. Comparison of erosive area before and after treatment in two groups of patients

	Case	Before treatment (cm ²)	After treatment (cm ²)	t	P
Observation group	30	0.82±0.31	0.21±0.19	9.189	<0.001
Control group	30	0.77±0.29	0.41±0.39	4.057	<0.001
t		0.645	2.525		
P		0.531	0.014		

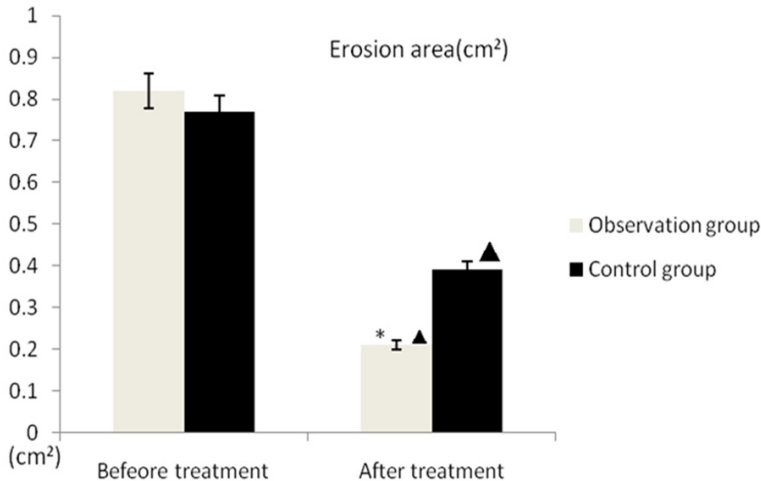


Figure 1. Comparison of erosive area before and after treatment in two groups of patients. Mucosal erosion area of the two groups after treatment compared with that before treatment, respectively, $\Delta P < 0.001$; comparison of mucosal erosion area of two groups after treatment, $*P < 0.001$.

Comparison of clinical efficacy between two groups of patients during observation period

After 4-week treatment, of the 30 patients in the experimental group, 17 cases were markedly effective, 8 cases effective and 5 cases ineffective, with a total effective rate of 83.33%. In control group, 15 cases were markedly effective, 9 cases effective, 6 cases ineffective, and the total effective rate was 80.00%. Although the effective rate of the experimental group was higher than that of the control group, but there was no statistical significance ($P > 0.05$) as shown in **Table 3**.

Comparison of the pain degree between two groups of patients

The difference of pain degree before and after pain treatment in each group was statistically significant (both $P < 0.05$), but the difference between two groups was not statistically significant ($P > 0.05$) as shown in **Table 4**.

Changes of erosion area in both groups of patients after treatment

The difference of erosion area in two groups of patients before and after treatment was statistically significant (both $P < 0.05$). The erosion area of two groups of patients after treatment was statistically different ($P < 0.05$), too as shown in **Table 5** and **Figure 1**.

Discussion

EOLP not only affects the quality of life of patients, but also being the risk of cancer development. The current study confirmed that cancer occurs in 0.40-6.25% of cases [11]. Clinically, the chances of cancer for EOLP with long-term erosive and ulcerative are more likely higher than it with other types of symptoms, and might eventually developed into oral squamous cell carcinoma. Therefore, the treatment of EOLP is urgent [12]. The current study suggests that EOLP could be an immune process triggered by certain antigens (such as microbes and viruses, etc.) [13]. Meanwhile the oral mucosa is rich in various cytokines including interleukins, chemokines, inflammatory cells such as macrophages and various lymphocytes, which work together to complete this immune process [14, 15]. Among them, the immunization of the T lymphocyte phase is considered to be the central link that causing a series of reactions to eventually trigger the death of the oral mucosa epithelial cells [16]. Recent studies find that EOLP patients have anxiety, sleep disorders and susceptibility to mental disease and other negative emotions [17, 18]. In addition, basic lesions of periodontal (plaque, calculus and plaque index) are also associated with the occurrence and development of EOLP [19]. The above shows that the occurrence of EOLP is the result of many factors, and the previous treatment focused on the continuous treatment of immunization while ignoring the periodontal treatment.

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Initial periodontal therapy mainly refers to the removal of periodontal plaque and calculus, thus reducing bacterial infection in patients' periodontal. The foreign studies confirmed that plaque and the periodontitis caused by it could increase the clinical symptoms of EOLP. Additionally, initial periodontal therapy can also reduce the level of inflammatory cytokines in patients [20]. Furthermore, the pain perception was significantly reduced in patients with EOLP after treatment of supragingival scaling, plaque-control guidance and oral health education; while pain was the leading cause of unhealthy psychosocial conditions in EOLP patients [21]. This research also confirmed that patients in the experimental group had a significant reduction in pain perception after initial periodontal therapy.

There are a large number of activated T lymphocyte infiltrations in EOLP tissue, indicating that local oral mucosal immune response plays an important role in the occurrence and development of EOLP. Therefore, immunotherapy is the basic treatment for EOLP patients [22, 23]. Triamcinolone acetonide, a type of corticosteroid drug, is used for the treatment of EOLP at present, which has the clinical effects of immunosuppression, anti-inflammatory, and antiviral etc. Triamcinolone acetonide reduces the pain of the patient, decreases the area of damaged mucosa and pain degree, and diminishes the area of the erosive surface in the lesion. Its mechanism is mainly due to triamcinolone acetonide. Other glucocorticoids as a commonly used immunosuppressive agents could inhibit the local humoral immunity of the mucous, thus reducing the high reactivity of the body and alleviating the clinical symptoms of immune damage. In addition, glucocorticoid also affects the metabolism of lymphocytes, which directly kills lymphocytes and make skin lesions subside, thus relieving itching. It is especially suitable for acute large area or multifocal EOLP [24]. In this research, the enrolled patients were locally treated with triamcinolone acetonide. The mucosal erosions in both groups were significantly reduced after treatment. In the experimental group, the erosion area was significantly smaller than the control group after the periodontal treatment was added. The effective rate of the clinical treatment was also better than that of the control group (83.33% vs. 80.00%), but there was no statistical differ-

ence. This may be related to the improvement of the oral microenvironment due to the elimination of periodontal local stimulation factors. However, the long-term effect needs a large number of sustained studies to further confirm.

In regards to the series of adverse reactions caused by long-term use of glucocorticoids, there is no statistical analysis of the occurrence of such adverse reactions due to the short duration of this research, which needs to be completed in further research.

In summary, the periodontal local environmental condition of EOLP patients affects their treatment response to a certain extent, and should draw enough attention from doctors and patients. In addition, EOLP periodontal therapy combined with topical medication therapy may assist in the treatment of clinical EOLP and improve its clinical efficacy.

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Disclosure of conflict of interest

None.

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