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Dates: Received: 17 March, 2017; Accepted: 21 March, 2017; Published: 22 March, 2017

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<https://www.peertechz.com>

Keywords: Nd:YAG laser; Oral lichen planus; Total glucosides of paeony; Erosive

Research Article

The Erosive Oral Lichen Planus Treatment with Nd:YAG Laser Combined with Total Glucosides of Paeony

Abstract

Background: To investigate the clinical effect of Nd:YAG laser combined with total glucosides of paeony (TGP) for the treatment of erosive oral lichen planus (OLP).

Study Design: Sixty patients diagnosed with erosive OLP with clinical symptoms were divided into an observation group (n=28) and a control group (n=32) using a random number table. All erosive OLP patients received TGP while only the patients in observation group subjected to Nd:YAG laser. The clinical effects were evaluated comparatively three months before and after the treatment.

Results: Three months after the treatment, the visual analogue scales (VAS) score and sign score for observation group improved significantly to (1.36±0.89) points and (2.32±1.56) points respectively. The average VAS score and sign score for the control group were (2.75±1.67) and (3.66±1.33) points. In both groups, the results of treatments were tended to be significantly better than before (P<0.05). The average VAS score and sign score were superior to those in the control group (P<0.05). The effectiveness for the observation group was significantly higher than the control group (82.1% vs. 53.1%).

Conclusion: Nd:YAG laser combined with TGP can improve the efficiency of the treatment for erosive OLP. The scheme is safe and effective and worth expanding in clinical practice.

Introduction

Lichen planus is a chronic, inflammatory disease implicating the mucosa or the skin in adult patients. The incidence rate of this illness is about 0.3 % to 2.3 % [1-3]. There are three clinical types for OLP: reticulate type, atrophic type and erosive type. The erosive type OLP is often accompanied by severe pain, which affects the patients' daily life by causing complications in eating, pronunciation, etc. Canceration rate is also higher in OLP compare to other types. This sickness often brings greater pain and psychological burden to the patients, which needs to be controlled and treated actively. At present, the pathogenesis of this disease is not clear, however the majority of researchers consider OLP as a T-cell mediated autoimmune disease [4]. For this study we used oral immune modulator—total glucosides of paeony (TGP) combined with Nd:YAG laser irradiate locally to treat patients with erosive OLP. Results of this study was satisfactory and promising.

Methods

From January 2013 to December 2014, nineteen male and

forty-one female patients in Hospital of Xuzhou aging from 41 to 78 years were chosen in to participate in this study.

Inclusion criteria

We considered three inclusion criteria for this study:

1. All patients were diagnostic with OLP. They all had clinical symptoms such as oral mucosa with reticular pattern and gray white patches, and that local had congestion, erosion and varying degrees of ulceration, These symptoms may or may not be accompanied by pain, numbness and rough sense.
2. All patients were adults over 21 years old.
3. All Patients were clear about the objective, methods and contents of this study and signed the consent forms.

Exclusion criteria

1. Patients with other oral mucosal diseases.

2. Patients with severe systemic disease and tumor.
3. Patients who took antibiotics one month prior to the beginning of this study, as well as patients under treatment with any kind of immune agents within three months prior to the beginning of this study.
4. Patients who took any drugs or amalgam fillings they may cause lichenoid reactions were excluded.
5. Patients who smoke cigarettes and consumed alcohol within three months prior to the beginning of this study;
6. Women in gestation and nursing period.
7. Patients who were not able to follow the physician's instructions and failed to record the experimental process completely
8. Patients who took TGP capsules and had apparent adverse reactions.

Using random number table method patients were divided into two groups. The observation group received laser irradiation plus medication while control group received only the medication (Table 1). Data presented in the table 1 were statistically compared, and the differences found to be statistically not significant ($P > 0.05$).

Patients in observation group were given local irradiation of Nd:YAG laser, using KJZ type Nd:YAG laser treatment from Hefei Hongbo Medical Science & Technology Co Ltd. Output laser wavelength used in this study was (650±10) nm (250 mJ/cm² energy density per minutes, spot diameter 2 mm). When each lesion was irradiated, its mucosa was gray-white. For large lesions we used fractional irradiation, Irradiation were performed three times a week for three weeks as one course of therapy. Continuous treatments were carried out in three courses with one week interval between each course. At the same time, patients took TGP Capsules (0.3 g/ grain, Ningbo Lihua Pharmaceutical Co Ltd) orally. During a day each patient took two capsules (0.6 g) every eight hours (3 capsules per day). The course of treatment was lasted for three months. In the case of severe diarrhea during the course of medication, the patients stopped taking the medication and were excluded from the study. The control group was treated only with TGP capsules. Method and time table for control group were exactly the same as observation group.

According to the efficacy evaluation standard for the treatment of atrophic and erosive OLP [5]. Evaluation indexes can be divided into 2 categories: objective index and subjective index.

Objective Index: The observer estimates the size of the lesion area.

Subjective Index: Symptom score is evaluated by visual analogue scales (VAS).

The pain level was assessed by patients themselves. They were asked to evaluate their pain level on a scale of 1 to 10 where 0 represented no pain, and 10 represented intolerable pain. Signs score for oral mucosal lesion area was as follow: (0): normal oral mucosa, no lesion; 1 point: mild mucosa; 2 points: the shrinking area was less than or equal to 1 cm²; 3 points: the shrinking area was larger than 1 cm²; 4 points: the erosion area was less than or equal to 1 cm²; 5 points: erosion area was larger than 1 cm². Efficacy evaluation criteria: Marked efficiency signs score was 0 or 1 point. Symptom score was 0 point when there was no obvious symptoms. We used the following formula for our calculations:

The results obtained here were shown by $\bar{x} \pm s$. To perform our statistical analysis we used SPSS 17.0 software. Inter-group differences were analyzed by *t* test. Count data were compared using the χ^2 test. $P < 0.05$ indicated statistical significance.

Results

After three months of treatment, the VAS score and physical signs score for the patients in two groups were improved. The VAS score for observation group was significantly higher than control group. The effective rate, measured through effective evaluation, in treatment group was 82.1 %. It was significantly higher than that of the control group ($P < 0.05$). Specific data are shown in Table 2. No serious adverse reaction was observed in patients during the course of the treatment. Compared to the time before treatment, effective signs and symptom scores were decreased significantly after treatment, and the signs and symptoms scores were unchanged or increased.

Results demonstrated that the VAS and signs score for the patients taking only TGP capsules for 3 months were highly improved. However the effective rate of the treatment was only 53.1 %. In our observation group that received a combination of TGP and local Nd:YAG laser irradiation, the signs score, VAS score and clinical efficacy were significantly better than those in the control group.

Discussion

Erosive OLP often persist for long periods of time and rather easily relapse after treatment. Data from previous studies suggest that the rate of cancer in patients with erosive OLP is higher than that of other types [6]. Currently, the leading method of treatment erosive OLP is corticosteroids or immunosuppressive agents in combination with local drugs or physical therapy [7]. At the present time, the glucocorticoids are still widely accepted as the first-line medication for the OLP treatment, however glucocorticoids may create quite a few adverse reactions in patients. It may cause local atrophy and become brittle of the oral mucosa, capillary expansion, affecting the oral environment and causing oral candidiasis as well as indigestion. It may also lead to the occurrence of osteoporosis. Furthermore, the healing of OLP is closely related to the emotional and mental state of patients. Using hormone

Table 1: Comparison of the patients in observation and control groups.

Group	No.	Sex (No.)		Average age (Year old, $\bar{x} \pm s$)	Course of disease (Month, $\bar{x} \pm s$)
		Man	Woman		
Observation group	28	9	19	51.34±10.07	37.41±2.75
Control group	32	10	22	49.81±11.85	39.13±1.96

Table 2: The VAS score and signs score before and after treatment. Comparison of clinical efficacy between observation and control groups.

Group	No.	VAS score (point, $\bar{x} \pm s$)		Signs score (point, $\bar{x} \pm s$)		Clinical efficacy evaluation			
		Before treatment	After treatment	Before treatment	After treatment	Marked	Effective	Ineffective	Effective rate (%)
Observation group	28	2.82±1.02	1.36±0.89 ^{ab}	4.29±0.60	2.32±1.56 ^{ab}	6	17	5	82.1 ^b
Control group	32	2.94±1.24	2.75±1.67 ^a	4.34±0.60	3.66±1.33 ^a	2	15	15	53.1

Notes: Comparing with the group before treatment, ^a $P < 0.05$; comparing with control group, ^b $P < 0.05$.

therapy for a long period of time may intensify patients' psychological problems. It may also negatively affect the treatment's results.

In recent years, laser therapy has gained traction as a viable method of treatment for patients suffering from erosive OLP. Laser therapy uses the low-energy laser to close capillary inside the oral mucosal lesions. This will inhibit the bacterial growth by decomposing and denaturing the bacterial proteins, therefore eliminate the local swelling. Dillenburg et al., reported some promising results on laser irradiation in OLP treatment [8]. This report showed that in patients with atrophic/erosive type OLP the laser therapy resulted in better results comparing to topical application of propionate.

It was reported that the efficacy of semiconductor laser in erosive OLP treatment is superior to that of conventional medications [9]. This method caused a minimal level of discomfort for the patients. Compared to oral medications, the noninvasive physical therapy is more desirable for patients and may encourage them to opt for this method of treatment. There are researches who believe that Nd:YAG laser with a wavelength of 1064 nm laser may produce better results in compare to semiconductor laser. The depth of penetration for Nd:YAG laser is moderate and can promote the release of morphine like substances in the body. These substances inhibit peripheral nerve excitability, and ease the pain [10].

TGP is the extract of ranunculaceae plant roots of Radix Paeoniae Alba. It can affect the immune system regulation in many ways. Chinese medicines believe that peony can nourish the blood and the liver, absorb sweat and ease the pain. In present study we evaluated the potential use of TGP as a possible remedy for erosive OLP. The results were promising and revealed that simple OLP treatment using oral TGP capsules have limited effects [11]. Our results demonstrated that using a combination of TGP and local Nd:YAG laser irradiation is a better solution for patients suffering from erosive OLP. The physical therapy is safe and patients would accept it with minimal reservation.

Conclusion

We conclude that a combination of Nd:YAG laser irradiation and TGP therapy may improve the curative effects of the treatment in patients with erosive OLP. The scheme is safe and effective and worth to be expanded further. This method offers a more effective solution for those suffering from refractory erosive OLP. We think that the present report opens the door for more studies on this subject maybe with using a bigger sample size. Additionally we think that increasing the period

of the follow-ups after the Nd:YAG laser irradiation and TGP therapy may give us a better understanding about the long-term effects of this method.

Sources of Funding

This study was supported by Jiangsu Province Medical Talents Project (QNRC2016390).

References

- Parashar P (2011) Oral lichen planus. Otolaryngologic Clinics of North America 44: 89-107. [Link: https://goo.gl/d1l8tw](https://goo.gl/d1l8tw)
- Xue JL, Fan MW, Wang SZ, Chen XM, Li Y, et al. (2005) A clinical study of 674 patients with oral lichen planus in China. J Oral Pathol Med 34: 467-472. [Link: https://goo.gl/hlgPrK](https://goo.gl/hlgPrK)
- Payeras MR, Cherubini K, Figueiredo MA, Salum FG (2013) Oral lichen planus: Focus on etiopathogenesis. Arch Oral Biol 58: 1057-1069. [Link: https://goo.gl/rg9Rta](https://goo.gl/rg9Rta)
- Lodi G, Scully C, Carrozzo M, Griffiths M, Sugerman PB, et al. (2005) Current controversies in oral lichen planus: report of an international consensus meeting Part 1. Viral infections and etiopathogenesis. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 100: 40-51. [Link: https://goo.gl/rTLEx3](https://goo.gl/rTLEx3)
- Society of Oral Medicine, Chinese Stomatological Association (2005) Standard for evaluation of effect for oral lichen planus(erosive, atrophic) (trial implementation). Chinese Journal of Stomatology 42: 92-93. [Link: https://goo.gl/XW3XbU](https://goo.gl/XW3XbU)
- Zhang JH, Zhou ZT (2007) Oral lichen planus: a retrospective study of 724 Chinese patients. Chinese Journal of Stomatology 42: 699-671. [Link: https://goo.gl/hAjGO1](https://goo.gl/hAjGO1)
- Carbone M, Arduino PG, Carrozzo M, Caiazzo G, Broccoletti R, et al. (2009) Topical clobetasol in the treatment of atrophic-erosive oral lichen planus: a randomized controlled trial to compare two preparations with different concentrations. J Oral Pathol Med 8: 227-233. [Link: https://goo.gl/gGHAJy](https://goo.gl/gGHAJy)
- Dillenburg CS, Martins MA, Martins MD, Munerato MC, Marques MM, Carrard VC, et al. (2014) Efficacy of laser phototherapy in comparison to topical clobetasol for the treatment of oral lichen planus: a randomized controlled trial. J Biomed Opt 19: 068002. [Link: https://goo.gl/6DMt0e](https://goo.gl/6DMt0e)
- Cafaro A, Arduino PG, Massolini G, Romagnoli E, Broccoletti R (2014) Clinical evaluation of the efficiency of low-level laser therapy for oral lichen planus: a prospective case series. Lasers Med Sci 29: 185-190. [Link: https://goo.gl/8C2jGh](https://goo.gl/8C2jGh)
- Agha-Hosseini F, Moslemi E, Mirzaii-Dizgah I (2012) Comparative evaluation of low-level laser and CO2 laser treatment of patients with oral lichen planus. Int J Oral Maxillofac Surg 41: 1265-1269. [Link: https://goo.gl/GY2UEo](https://goo.gl/GY2UEo)
- Yan D, Jinfan P, Long O (2012) Clinical outcomes of all-trans retinoic acid compound and capsule of total glucosides of peony for the treatment of reticular oral lichen planus: a half-year follow-up study. Chinese Journal of Stomatology 47: 118-122. [Link: https://goo.gl/uc5gwPs](https://goo.gl/uc5gwPs)

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