



EFFICACY OF LOW-LEVEL LASER THERAPY IN THE MANAGEMENT OF ORALLICHEN PLANUS

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Abstract

Background: Oral lichen planus is a common chronic inflammatory disease of the oral mucosa with malignant potential. Topical steroids are widely used and accepted as the primary treatment of choice. The greatest disadvantage of corticosteroids is the secondary infection which develops along with the local or systemic immune suppression. Another treatment modality is Lasers. Lasers have been used in dentistry since 1960. Low level laser therapy (LLLT) is widely used in the management of various inflammatory mucosal lesions. So low level laser therapy can be considered as an ideal alternative for management of recalcitrant OLP.

Materials and methods: Study type is Randomized Control Trial. A total of 50 patients were selected. 25 patients were in the control group to whom topical steroids were given. 0.1% Triamcinolone acetonide was given thrice daily for 8 weeks for those in the control group. 25 patients were in the case group to whom LLLT was given. Low level laser with 810 nm and 0.5 watt was used once in a week for 8 weeks for patients in the case group. Assessment was done in the end of each week till 8th week. In the end of 12th week final assessment and follow up was done.

Results: Inter group comparison of pinboonnyom scores shows that results are almost similar in two groups. There is no significant difference between both the groups. Rapidity of the response was greater in the control group. 12th week assessment scores were similar in both the groups. VAS also shows that the responses were better in the control group in the initial week. In the 7th week, similar responses were noted. Present randomized control trial shows a female predilection. Patients of xiii 35-50 age group are more affected with OLP. Erosive Lichen Planus patients were prevalent more than the reticular type in the present study.

Conclusion: The present study showed that Laser provides a long-term sustained relief comparable to corticosteroids without any of its side effect. Recommendations with standardized protocol for the use of clinician, can be issued by important associations. So that it can be effectively used in the management of OLP.

Key words: Oral lichen planus, Low Level Laser Therapy

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1. Introduction

Oral Lichen Planus (OLP) is a chronic immunologic inflammatory mucocutaneous disorder^{1,2}. OLP is classified as Reticular, Papular, Plaque like, Atrophic, Erosive and Bullous types¹. The atrophic, erosive, and bullous forms are generally associated with symptoms ranging from mild burning sensation to severe pain³. Its prevalence has been reported between 0.5% and 2.2%^{1,2}. Malignant transformation seems to be more likely in erosive lesions, possibly due to the exposure of the deeper epithelial layers to oral environmental carcinogens⁴.

Aetiology behind OLP is unknown. Immune system has a primary role in the development of this disease. Regarding clinical manifestation, cutaneous lesion may be encountered in approximately 15% of patients with OLP. Several topical drugs have been suggested, including steroids, calcineurin inhibitors, retinoids and ultraviolet phototherapy⁵. Among these, topical steroids are widely used and accepted as the primary treatment of choice. Examples of topical corticosteroids include Hydrocortisone, Clobetasone, Betamethasone, Clobetasol⁶.

The greatest disadvantage of corticosteroids is the secondary infection which develop along with the local or systemic immunosuppression⁶. In addition, mucosal adhesion in case of topical application & patient compliance regarding the use of topical application or intake of drugs can also be major obstacle encountered in management of these lesions. Another disadvantage of prolonged use of these drugs is tachyphylaxis, causing a decrease in their biological effectiveness. The adverse effects of systemic steroids include Cushing's habitus, Fragile skin, purple striae, Hyperglycaemia, Muscular weakness, Susceptibility to infections,

Delayed healing, Peptic ulceration, Osteoporosis, psychiatric disturbances, Suppression of hypothalamo-pituitary-adrenal (HPA) axis⁷. Second line of treatment is calcineurin inhibitors⁸.

According to another study titled "Medical Management of Oral Lichen Planus: A Systematic Review," it is concluded that. Though, topical corticosteroids and calcineurin inhibitors are the most common drugs used for treatment of symptomatic OLP, from the trials included in this systematic review, the evidence suggesting superiority of either in reducing pain and clinical signs of OLP are weak. Topical retinoids appear as an alternative choice in OLP treatment⁸. Whether keratotic OLP better responds to topical retinoids than erosive OLP is still an open question that deserves further comparative and controlled clinical trials. Isotretinoin is the most frequently employed retinoid in the treatment of OLP. The clinical and/or histopathological efficacy of retinoids was recorded in most of the selected studies. A transient and moderate burning sensation was the most frequently reported side effect⁸.

Another treatment modality is Lasers. Lasers have been used in dentistry since 1960. Low level laser therapy (LLLT) is widely used in the management of various inflammatory mucosal lesions⁹. This act by bio-stimulation. Laser therapy does not cause any secondary immunosuppressant action and is completely handled by the clinician, thereby bypassing the problems of patient compliance and immunosuppression. So low level laser therapy can be considered as an ideal alternative for management of recalcitrant OLP⁹. The major disadvantage is that LLLT requires equipment and the effectiveness is dependent on the skill of the operator.

The aim of the study is to assess the efficacy of low-level laser therapy (LLLT) in management of recalcitrant Oral Lichen Planus. Objectives is to use

LLLT in the management of recalcitrant OLP and to compare efficacy of low-level laser therapy to the efficacy of topical steroid in the management of recalcitrant OLP.

2. Materials and Methods

Forty patients who were diagnosed with OLP according to WHO criteria and who were not responding to conventional treatment for 2 weeks were randomly allocated into an experimental (laser treated) and a control group (corticosteroid treated).

Patient exclusion criteria included those presenting with immunosuppressant therapy for other disease, histopathological proven cellular atypia, pregnant women, not willing to take part in the study.

After obtaining the informed consent from

each subject, a detailed case history was recorded in all the subjects. 25 patients were in the control group to whom topical steroids were given. 0.1% Triamcinolone acetonide was given thrice daily for 8 weeks for those in the control group. 20 patients were in the case group to whom Low level laser therapy (LLLT) was given. Low level laser with 810 nm and 0.5 watt was used once in a week for 8 weeks for patients in the case group. Assessment was done in the end of each week till 8th week. In the end of 12th week final assessment and follow up was done. Grading of OLP was done based on pinbooniyom et al grading system and pain assessment was done using Visual analogue scale (VAS). observer was blinded to the treatment administered to the individual. Data thus obtained were analysed.



Image 1 - Baseline (Steroid Group)



Image 2 - At 6 week - treated with topical corticosteroid



Image 3 - At 12th week - treated with topical corticosteroid



Image 4- At baseline (laser group)



Image 5- At 6th week- (treated with laser)



Image 6- At 12th week- (treated with laser)

3. Result

A total of 50 patients with oral lichen planus were selected. Out of that 38 were female and 12 were male. Patients with the age group between 35-40 are affected more with OLP. Erosive lichen planus was predominant compared with reticular type. Irrespective of the age, gender, and type of lesion, they were randomly arranged into two groups. Group 1 was case group which is the laser group, group 2 was control group which is the steroid group. For the control group, patients were put on the topical steroid triamcinolone acetonide for 8 weeks. For test group, patients were treated with laser once a week for 8 weeks. Patients were followed up for 12 weeks. Scoring was done with VAS and Pinboonniyom score. Intra group comparison of laser and intra group comparison of steroid was done using paired t test.

Comparison between two groups was done using independent t test. Inter group comparison of pinboonniyom scores shows that results are almost similar in two groups. There is no significant difference between both the groups. Rapidity of the response was greater in the control group. 12th week assessment scores were similar in both the groups. VAS also shows that the responses were better in the control group in the initial

week. In the 7th week, similar responses noted. Intra group comparison of pinboonniyom grading score for measuring the size of the lesion at different intervals in Laser group shows the mean difference in group 1 was highest between 3-4 weeks with a P value of 0.001 which is statistically significant. Intra group comparison of VAS score of pain at different intervals in Laser group shows highest mean difference of -1.05 between 7-8 weeks with a P value of 0.001 which is statistically significant. Intra group comparison of pinboonniyom grading score for measuring the size of the lesion at different intervals in steroid group shows highest mean difference of -0.95 between 3-4 weeks with a P value of 0.001 which is statistically significant. Intra group comparison of VAS score of pain at different intervals in steroid group shows maximum mean difference of -1.10 between 2-3 week with a P value of 0.001 which is statistically significant (Table 1). Comparison of pinboonniyom scoring between the groups at different intervals shows P value is insignificant (Table 2). Present randomized control trial shows a female predilection. Patients of 35-50 age group is more affected with OLP. Erosive Lichen Planus patients were prevalent more than the reticular type in the present study.

Table 1: Comparison of pinbooniyom scoring between the groups at different intervals

Intervals	Group 1 Mean±SD	Group 2 Mean±SD	T-value	p-value
1 week	6.55±1.63	6.50±1.23	0.12	0.91
2 weeks	6.25 ±1.16	5.85±1.26	0.87	0.39
3 weeks	5.55±1.50	5.10±1.25	1.02	0.31
4 weeks	4.65±1.46	4.15±1.18	1.19	0.24
5 weeks	3.90±1.29	3.25±1.06	1.73	0.09
6 weeks	3.15±1.13	2.70±1.03	1.31	0.19
7 weeks	2.35±1.22	2.30±0.86	0.14	0.88
8 weeks	1.75±0.91	1.70±0.73	0.19	0.84
12 weeks	1.25±0.55	1.25±0.44	0.0	1.00

* p value <0.05 is statistically significant; ** <0.001 is statistically highly significant#paired t test; negative sign indicates a reduction.

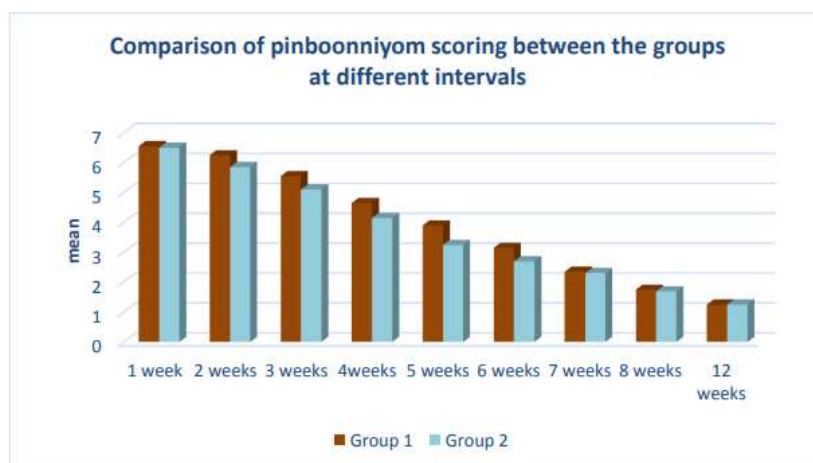
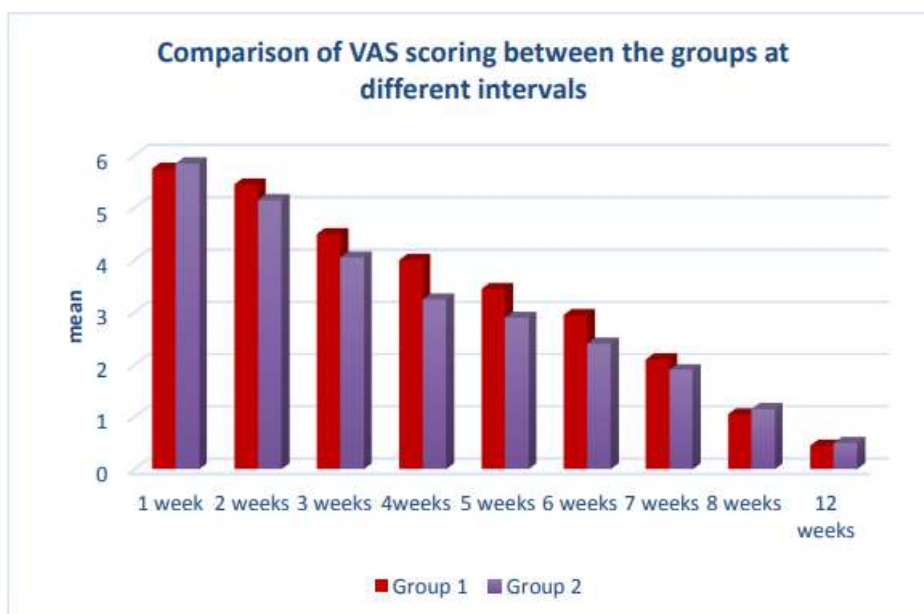


Table 2+: Comparison of VAS scoring between the groups at different intervals

Intervals	Group 1 Mean±SD	Group 2 Mean±SD	T-value	p-value
1 week	5.75±1.88	5.85±1.69	-0.17	0.86
2 weeks	5.45±1.84	5.15±1.59	0.54	0.58
3 weeks	4.50±1.73	4.05±1.35	0.19	0.36
4 weeks	4.00±1.45	3.25±1.16	1.80	0.07
5 weeks	3.45±1.39	2.90±1.02	1.42	0.16
6 weeks	2.95±1.14	2.40±0.94	1.65	0.11
7 weeks	2.10±1.02	1.90±0.78	0.69	0.49
8 weeks	1.05±0.94	1.15±0.93	-0.33	0.73
12 weeks	0.45±0.68	0.50±0.61	-0.24	0.81

* p value <0.05 is statistically significant; ** <0.001 is statistically highly significant#paired t test; negative sign indicates a reduction.



4. Discussion

Lichen planus is an immunologically mediated inflammatory disorder involving the skin, nails, hair follicles and mucous membranes⁵. It is estimated to affect 0.5% to 2.0% of the general population¹¹. Etiology of OLP is unclear and is multifactorial OLP is caused by (CD-8) cell mediated damage to the basal keratinocytes leading to apoptosis¹⁴. The antigen inciting the cytotoxic T cells could be any of the above-mentioned factors including stress, chronic liver disease, HCV virus, dental restorative materials and/or drugs. Current treatment strategies aim to reduce the symptoms or to eliminate the symptoms. Topical steroids such as Hydrocortisone, Clobetasone, Betamethasone, Clobetasol are widely used and accepted as the primary treatment of choice⁹. Systemic corticosteroids can also be used which include Prednisone, Betamethasone, Dexamethasone, Hydrocortisone and Triamcinolone. The disadvantages of topical steroids include topical immunosuppression, mucosal adhesion, tachyphylaxis & patient compliance regarding the use of topical application. Long-term use of high potency topical steroids may lead to the development of collateral effects, including candidiasis, burning sensation, mucosal atrophy, bad taste, nausea, sore throat and dry or swollen mouth¹⁰. The adverse effects of systemic steroids include Cushing's habitus, Fragile skin, purple striae, Hyperglycaemia, Muscular weakness, Susceptibility to infections, Delayed healing, Peptic ulceration, Osteoporosis, psychiatric disturbances, Suppression of hypothalamo-pituitary adrenal (HPA) axis⁴.

Low level laser therapy (LLLT) is widely used in the management of various inflammatory mucosal lesions⁵. This act by bio stimulation. Laser therapy does not cause any secondary immune-suppression. Moreover, it is a painless

procedure and the time needed for this procedure is very less. It is completely handled by the clinician, thereby bypassing the problems of patient compliance and immunosuppression⁹. So, it makes very agreeable for the patient to undergo this therapy. So low level laser therapy can be considered as an ideal alternative for management of recalcitrant OLP. The major disadvantage is that LLLT requires expensive equipment and the effectiveness is dependent on the skill of the operator. In the present randomized control trial, we compared efficacy of low-level laser therapy with topical steroid in the management of oral lichen planus patients.

In the present study, among the 50 cases, 18 were diagnosed with reticular OLP, 32 were diagnosed with erosive OLP. Existing statistics say there are more reticular lesions. The most common form of oral lichen planus is reticular lichen planus. It will be mostly asymptomatic. So, it is undiagnosed.^{11,12} Since patient with erosive lichen planus has more associated symptoms, the reporting rate is more than the reticular OLP. This explains why we have more patient with erosive OLP in our studies.

In the laser group, there was a progressive decrease in the pinbooniyom score over 12 weeks. The maximum difference is seen in 3rd and 4th week. Over a period, between baseline to 12th week, pinbooniyom score and VAS have reduced. The decrease in pinbooniyom score indicates that, the size and intensity of the lesion has reduced and shows that there is a resolution of the lesion. In a randomized control trial by Jajaram et al, response rate was defined based on changes in the appearance score and pain score (Visual Analogue Scale) of the lesions before and after each treatment. Study resulted as appearance score, pain score, and lesion severity was reduced in both groups. No significant differences were found between the treatment groups

regarding the response rate and relapse. Study demonstrated that LLLT was as effective as topical corticosteroid therapy without any adverse effects and it may be considered as an alternative treatment for erosive-atrophic OLP in the future.⁴

VAS is much better in steroid group. One of the mechanisms of action of steroids is that it modifies inflammatory response decreasing prostaglandin production. Since prostaglandins are also the mediators of pain, decreasing their production can decrease the pain. This is also present in laser but to a lesser extent when compared with steroid. That is why we see a better response in. Based on our study, laser is as effective as steroid in long term management. But the rapidity of response and the decrease in the intensity of pain in the initial week was better in steroid group. So, seeing the result, there is no great advantage to laser with respect to patient response. Previous studies also show similar results. There are only few studies which showed laser superior to steroids⁶.

As the irradiation parameters and the frequency of the dose will play an important role in the efficacy of this treatment, it is important that a standardized protocol should be formulated for use of laser in management of OLP. As it is a treatment protocol in complete control of physician, this treatment can become a potent tool in management of OLP if the protocols are standardized.

5. Conclusion

The present study showed that Laser provides a long term sustained relief comparable to corticosteroids without any of its side effect. Recommendations with standardized protocol for the use of clinician, can be issued by important associations. So that it can be effectively used in the management of OLP.

6. References

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