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A COMPARATIVE STUDY FOR MEASURING EFFICACY OF LOW-LEVEL LASER VERSUS TOPICAL CORTICOSTEROID FOR MANAGEMENT OF ERYTHEMA AND PAIN IN ORAL LICHEN PLANUS - IN VIVO STUDY

Dental Science

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ABSTRACT

Oral Lichen planus (OLP) is an autoimmune, chronic, mucocutaneous disease affecting skin, genital mucosa, nails, scalp and oral mucosa. Low level lasers therapy (LLLT) has come up now days as a new treatment modality for oral lichen planus without having significant adverse effects. Total twenty four (24) patients who were diagnosed with signs and symptoms of oral lichen planus and included in the study this study evaluate and compare the efficacy of low level laser therapy and topical corticosteroid (0.1% Kenacort gel) therapy in the management of OLP. In our study we have found more number of oral lichen planus patients in the age range from 20-70 years with a mean age of 40 ± 13. Whereas, a significant reduction in pain scores were found in patients treated with low level lasers than in patients treated with topical corticosteroids. Patients treated with low level laser showed a great enhancement in quality of life and resolution of symptoms as compared to corticosteroid.

KEYWORDS

INTRODUCTION

Oral Lichen planus (OLP) is an autoimmune, chronic, mucocutaneous disease affecting skin, genital mucosa, nails, scalp and oral mucosa. Intraorally it affects mostly the buccal mucosa, tongue, and gingiva.[1] Cutaneous and oral involvement does not necessarily occur at the same time and generally develops within several months after the appreance of oral lesion [2]. It was reported in few studies that the prevelance of oral lichen planus is eight times greater than its cutaneous counterpart.[3] OLP is most commonly found in the fourth decade of life, affecting women more than men in a ratio of 1.4:1. 1–2% of population is suspected to affect with this disease .[3]Oral lesions are commonly found to be present in ＞70% of population affected with skin lesions. Most common etiology of this lesion is found to be idiopathic ,however other listed causes can be due to viral infections, stress ,collagen disease , drug-related like antihypertensives , oral hypoglycemics, non-steroidal anti-inflammatory drugs, anti-arthritics, xanthine oxidase inhibitors and first generation anti depressants .[1]

Low level lasers therapy (LLLT) has come up now days as a new treatment modality for oral lichen planus without having significant adverse effects.[5, 6] it has been found that **LLLT** has biostimulating effects on oral mucosa thus offering tissue healing by controlling inflammatory response. [5] Effect of LLLT consist of vasodilatation, It also enhances the cellular metabolism and increases the proliferation of neutrophil and fibroblast. It increases the pain stimulation threshold. [5]The interactions of LLLT are governed by wavelength of light used, power and energy at the site, the duration of intervention, and the tissue surface on which it is applied. [7]

AIMS AND OBJECTIVES

AIM:- To evaluate and compare the efficacy of low level laser therapy and topical corticosteroid(0.1% Kenacort gel) therapy in the management of oral lichen planus.

OBJECTIVES:-

1. To assess the erythema and pain in OLP before and after treatment with low level laser therapy.
2. To assess the erythema and pain in OLP before and after treatment with topical corticosteroid therapy.
3. To compare the results of erythema and pain within the groups that is before and after treatment with low level laser therapy and topical corticosteroid therapy.

MATERIAL AND METHODS

A comparative in vivo study of 24 adult patients ranging from age group 20 to 70 years suffering with oral lichen planus who came to Department of Oral Medicine and Radiology, were included in study.

Sampling technique used to collect the data was convenient sampling and randomization with sequentially numbered opaque sealed envelopes (SNOSE) method. Split mouth technique was used in this study on patient with bilateral oral lichen planus Following parameters were included in the establishment of diagnosis

1. Patients suffering from oral lichen planus and diagnosed using normal clinical investigation methods consisting of inspection, stretchability test, scrapability test and biopsy where necessary.
2. A detailed case history from was taken into consideration all aspects related to oral lichen planus consisting of recording of chief complaint and history of complaint was taken into account.

Informed consent was taken from each patient before treatment. All participants in both groups underwent oral hygiene instructions with complete removal of plaque and calculus.

Inclusion criteria-

1. Patients with age ranging from 20-70 years
2. Patients with clinically proven diagnosis of OLP.
3. Patient with bilateral oral lichen planus.
4. Patients willing to give written informed consent.

Exclusion criteria-

1. Presence of systemic diseases that may cause OLP, such as hepatitis C, diabetes, Systemic lupus erthematosus.
2. Pregnant or breast feeding women.
3. Use of drugs such as antihypertensives, diuretics, nonsteroidal anti-inflammatory drugs, anti-convulsants, drugs for treating tuberculosis and systemic corticosteroid.
4. Previous OLP treatment within 1 month before the beginning of the study.
5. Patients suffering from any other intra oral mucosal lesion such as DLE,SLE, Leukoplakia , Oral submucous fibrosis.

Group A-Low Level Laser -

Lesion in the LLLT group was treated with laser irradiation. In the laser

irradiation group the exposure time was 8 minutes for four successive applications for two minutes each, the exposure power setting was (0.3 watt), with Silberbauer India 660nm, at 2.2 j/min. The lesions and 0.5 cm of their surrounding tissue was illuminated with a spot size of 1 cm^2. Laser irradiation was done every alternate day, for a maximum of 10 sessions. After each laser session patients was advised for cold application to prevent edema.

Group B-Topical corticosteroid -
Lesion in topical corticosteroids group was treated with 0.1% triamcinolone acetonide gel(Kenacort gel).Patients were trained to apply the gel four times per day for four weeks and patients were followed up weekly during this period.The severity of the lesions was scored according to presence of reticular, atrophic, or erosive lesions as follows:

Reticular/hyperkeratotic lesions were scored from 0 to 1
0 = no white striations, 1 = appearance of white striations

Erythema score (Guy's and St Thomas')
0 = No erythema, 1 = mild erythema (eg : on gingiva , papillae only or less than 3mm along margins), 2 = marked erythema (eg: full thickness on gingiva , extensive with atropy or oedema on non- keratinised mucosa), 3 = Ulceration at the site

To evaluate the pain experience of the patients, a 0 to 10 visual analogue scale (VAS) was used, with the following scores:
3 = 7 < VAS≤10, **2** = 3.5 < VAS≤7, **1** = 0 < VAS≤ 3.5, **0** = no pain

The efficacy indices (EI) of the LLLT and corticosteroid treatments were calculated on a five-rank scale according to the methods of Liu et al., with some modificationsas follows:[1] [(before treatment total score - after treatment total score) ÷before treatment totalscore]×100%.

According to this scoring system, symptom improvement was scored as follows:
Healed = EI=100%, Marked improvement = 75%≤EI < 100%, Moderate improvement = 25%≤EI < 75% Mild improvement = 25% < EI < 0 , No improvement = 0.

Duration of study - 18 months
Method of data analysis-

The statistical test/s used to analyze the data:- 1. Mann- whitneys U test , 2Wilcoxon sign ranked test
OBSERVATIONS AND RESULTS
Total twenty four (24) patients who were diagnosed with signs and symptoms of oral lichen planus and included in the study out of which 13 were female and 11 were male candidates.

ERYTHEMA
TABLE – 1:- Erythema of the lesion before treatment

Erythema of the lesion Before Treatment	Group A		Group B		Total	p value
	N	Percent	N	Percent		
0	22	91.7%	22	91.7%	44	0.999
1	2	8.3%	2	8.3%	4	
Total	24	100.0%	24	100.0%	48	

TABLE- 2:- Erythema of the lesion after treatment

Erythema of the lesion After Treatment	Group A		Group B		Total	p value
	n	Percent	n	Percent		
0	24	100.0%	23	95.8%	47	0.031
1	0	0.0%	1	4.2%	1	
Total	24	100.0%	24	100.0%	48	

TABLE – 3:- Change in erythema

Change in Erythema	Group A		Group B		Total	p value
	n	Percent	n	Percent		
0	22	91.7%	23	95.8%	45	1.000
1	2	8.3%	1	4.2%	3	
Total	24	100.0%	24	100.0%	48	

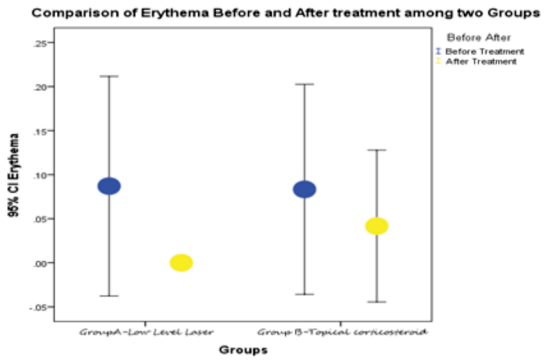

FIGURE 1 :- Graph shows that maximum reduction in erythema was seen in group A patients.

PAIN SCORES
TABLE -4 :- PAIN BEFORE TREATMENT

Pain Before Treatment	Group A		Group B		Total	p value
	n	Percent	n	Percent		
2	4	16.7%	6	25.0%	10	0.724
3	20	83.3%	18	75.0%	38	
Total	24	100.0%	24	100.0%	48	

TABLE-5:- PAIN AFTER TREATMENT

Pain After Treatment	Group A		Group B		Total	p value
	n	Percent	n	Percent		
0	10	41.7%	23	95.8%	33	1.000
1	12	50.0%	1	4.2%	13	
2	2	8.3%	0	0.0%	2	
Total	25	104.2%	24	100.0%	49	

TABLE – 6:- CHANGES IN PAIN SCORE

Change in Pain Score	Group A		Group B		Total	p value
	n	Percent	n	Percent		
1	10	41.7%	4	16.7%	14	0.018
2	10	41.7%	14	58.3%	24	
3	4	58.3%	6	25.0%	20	
Total	24	100.0%	24	100.0%	48	

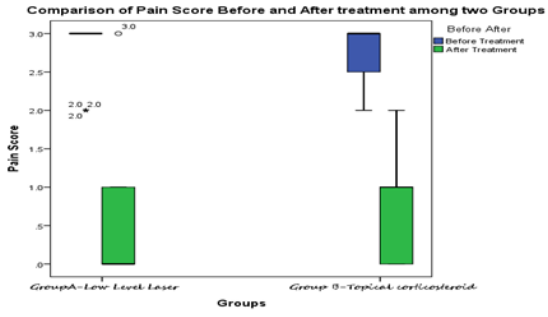

FIGURE 2:-Group A shows more reduction in pain scores after treatment as compare to group B.

TABLE 7:- Comparison of erythema and pain before treatment

	Group A			Group B			Mann Whitney U	p value
	Mean	Median	SD	Mean	Median	SD		
Erythema of The Lesion Before Treatment	.08	0.00	.282	.08	0.00	.282	288.0	1.000
Pain Before Treatment	2.83	3.00	.381	2.75	3.00	.442	264.0	0.482

Table 7: shows that pain of the lesion scores were greater in group A patients as compare to group B patients erythema scores were same in both the groups

Table 8 - Comparison Of Mean Of Erythema And Pain After Treatment

	Group A			Group B			Mann Whitney U	p value
	Mean	Median	SD	Mean	Median	SD		
Erythema of The Lesion After Treatment	0.00	0.00	0.000	.04	0.00	.204	276.0	0.317
Pain After Treatment	.25	0.00	.442	.67	1.00	.637	186.0	0.015

Table 8 : Shows reduction in erythema and pain was greater in group A patients .

Table 9:- Change In Erythema And Pain Scores Before And After The Treatment

	Group A			Group B			Mann Whitney U	p value
	Mean	Median	SD	Mean	Median	SD		
Change In Erythema	.08	0.00	.282	.04	0.00	.204	276.0	0.555
Change In Pain Score	2.58	3.00	.504	2.08	2.00	.654	172.0	0.008

Table 9 Shows that change in erythema and pain scores were more in group A as compare to group B .

Table 10:- Comparison Of Percentage Change In, Erythema And Pain Within Two Groups And Before And After The Treatment

	Group A			Group B			Mann Whitney U	p value
	Mean	Median	SD	Mean	Median	SD		
Percentage Change in Erythema	8.33%	0.00%	28.23%	4.17%	0.00%	20.41%	276.0	0.555
Percentage Change in Pain Score	91.67%	0.00%	14.74%	76.39%	66.67%	22.48%	180.0	0.011

Table 11 :comparison Of Erythema And Pain Score Amongst Group 2 Before And After The Treatment

Group A	Before treatment			After Treatment			Z (Wilcoxon Sum Ranked)	p value
	Mean	Median	SD	Mean	Median	SD		
Erythema of The Lesion	.08	0.00	.282	0.00	0.00	0.000	-1.414b	0.157
Pain Score	2.83	3.00	.381	.25	0.00	.442	-4.428b	0.000

Group B	Before treatment			After Treatment			Z (Wilcoxon Sum Ranked Test)	p value
	Mean	Median	SD	Mean	Median	SD		
Erythema of The Lesion	.08	0.00	.282	.04	0.00	.204	-1.000b	0.317
Pain Score	2.75	3.00	.442	.67	1.00	.637	-4.399b	0.000

Table 11 : Erythema was completely reduced in both the groups. Pain was diminished only in group B.

DISCUSSION:

Oral lichen planus (OLP) is an immune related disease affecting skin and mucosa. Stress, anxiety and other factors in relation with immune system are thought to be the causative factors which probably trigger this disease. There are various topical treatments, including corticosteroids, immunosuppressants such as cyclosporin, tacrolimus, and retinoids which have been tried to relieve OLP. [9, 10] The most commonly used drugs are Corticosteroids, but other drugs such as azathioprine, calcineurin inhibitors, mycophenolate mofetil, dapsone, retinoids, and hydroxychloroquine can also be used in recalcitrant cases. The use of corticosteroids, either topical or systemic and nonsteroidal anti-inflammatory drugs leads to many side effects. So, a newer non medicational and less stressful treatment modality is used here known as low level laser trerapy. [8,9,10] Low level laser acts by interactions of low wavelength light with tissues. These interactions are affected by wavelength of light used, power and energy applied on tissues, duration of intervention, and the type of tissues on which laser is used. According to recearches, the dose of low level laser should be in below 10 J/cm^2 for its therapeutic use. [9,10]

EVALUATION OF ERYTHEMA

There were only few patients with erosive lichen planus in our study and all of them responded well with low level laser as well as topical corticosteroid .So the remission of erythematous lesion was approximately similar with both the treatment modalities . Most of these patients got relieved in second week of treament.In one study it wasreported two cases of erosive oral lichen planus which was treated with low level laser with 630 nm wavelength and 10mW. They also reported decrease in redness of lesion and lesion turned to atropic/ keratotic lichen planus in one month.[5]

EVALUATION OF PAIN

This study shows a significant pain reduction scores in patients treated with low level lasers than in patients treated with topical corticosteroids. Maximum reduction in pain scores were noted in second week of treatment .Similar type of results were found in an another study [4] where they used diode laser 970 nm in a continuous, non – contact mode with an output power of 3W, for 8 minutes on 10 OLP patients. They reported a high statistical improvement in pain scores and great enhancement in quality of life with complete resolution of symptoms in patients treated with LLLT .In a study where lasers with 308 nm wavelength was used no improvement was noticed in maximum patients. The laser only helped in stabilization of the lesions in few patients and caused worsening in some of them.[11] Another study used 308nm excimer laser in non- responsive patients of OLP, every week up to seven months with a power of 100-400mJ/cm^2. Out the eight patients, only five showed >75% improvement in symptoms. [12]

CONCLUSION

In our study we have found more number of oral lichen planus patients in the age range from 20-70 years with a mean age of 40 ± 13. This age range is similar to many other observational studies also. In the current study the buccal mucosa was the most predominant site for OLP accounting for approximately 80% of cases. Our observation was in agreement with other studies. There were only few patients with erosive lichen planus in our study and all of them responded well with low level laser and topical corticosteroid . The remission of erythematous lesion was approximately similar with both the treatment modalities most of these patients got relieved in second week of treatment.

Whereas, a significant reduction in pain scores were found in patients treated with low level lasers than in patients treated with topical corticosteroids. In most of the patients, reduction in pain was observed from second and third session of low level laser treatment and remission of pain was mainly in seventh or eighth session. Maximum reduction in pain scores were noted in second week of treatment. Thus the patients treated with low level laser showed a great enhancement in quality of life and resolution of symptoms as compared to corticosteroid. **Hence, we conclude that low level laser can be considered as an alternative treatment modality with fewer side effects in oral lichen planus patients**.

LIMITATIONS

This study was done with a smaller sample size, hence a study with larger sample size and a longer follow-up period is recommended in future.

Conflict of Intrest : Nil
Source of Funding : Nil

REFERENCES:

1) Derikvand N, Ghasemi S S, Moharami M, Shafiei E, Chiniforush N. Management of Oral Lichen Planus by 980 nm Diode Laser. J Lasers Med Sci 2017 Summer;8(3):150-154.
2) Salman SM ,Kibbi AG, Zaynoun S. Actinic Lichen planus . A clinicopathologic study of 16 patients. J Am Acad Dermatol 1989; 20: 226-31.
3) Lavanya N, Jayanthi P, Rao U K, and Ranganathan K.Oral lichen planus: An update on pathogenesis and treatment. J Oral Maxillofac Pathol. 2011 May-Aug; 15(2): 127–132.
4) Elshenawy H M, Eldin A M, Abdelmonem M A. Clinical Assessment of the Efficiency of Low Level Laser Therapy in the Treatment of Oral Lichen Planus. Open Access Macedonian Journal of Medical Sciences. 2015 Dec 15; 3(4):717-721.
5) Mahdavi O, Boostani N, Jajarm HH, Falaki F, Tabesh A. Use of Low Level Laser Therapy for Oral Lichen Planus: Report of Two Cases. J Dent Shiraz Univ Med Sci.2013;14(4):201-204.
6) Sahebjamee M, Arbabi-Kalati F. Management of oral lichen planus. Arch Iranian Med 2005; 8(4):252-256.
7) Kazancioglu H O, Erisen M. Comparison of Low-Level Laser Therapy versus Ozone Therapy in the Treatment of Oral Lichen Planus . Ann Dermatol. 2015; 27(5): 485-491.

8) Elshenawy H M, Eldin A M . A Comparative Evaluation of Low-Level Laser and Topical Steroid Therapies for the Treatment of Erosive-Atrophic Lichen Planus. Macedonian Journal of Medical Sciences. 2015 Sep 15; 3(3):462-466.
9) Mostafa1 B, Zakaria M . Evaluation of Combined Topical Ozone and Steroid Therapy in Management of Oral Lichen Planus . Macedonian Journal of Medical sciences.2018; vol. 6(5).
10) Nosratzehi T. Oral Lichen Planus: an Overview of Potential Risk Factors, Biomarkers and Treatments. Asain Pac J Cancer Prev.2018;19(5):1161-1167.
11) Passeron T, Zakaria W, Ostovari N, Mantoux F , Lacour JP, Ortonne JP. Treatmrnt of erosive oral lichen planus by the 308 nm excimer laser. Lasers surg Med 2004;34:205.
12) Trehan M, Taylor CR. Low- dose excimer 308- nm laser for the treatment of oral lichen planus. Arch Dermatol 2004;140:415-420.