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COMPARATIVE EVALUATION OF EFFICACY OF LOW-LEVEL LASER THERAPY AND TOPICAL CORTICOSTEROID IN MANAGEMENT OF ORAL LICHEN PLANUS - IN VIVO STUDY.

Dental Science

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ABSTRACT

Lichen planus is a common chronic mucocutaneous disease of uncertain origin .The treatment includes topical , intralesional and systemic corticosteroids , long-term use of which may cause some adverse effects . Low-level laser therapy (LLLT) has potential biostimulating effects by controlling the inflammatory process and promoting the healing of the tissues, without undesired adverse effect.

Material and methods: 24 adult patients with Oral Lichen Planus were taken for study. . Lesions were divided randomly by SNOSE method in two groups. In each patient one side was treated with low level laser(Silberbauer India 660nm, 0.3 watt) every alternate day for a maximum of 10 sessions and other side with topical corticosteroid(0.1%Kenacort gel)four times per day for four weeks. All cases in both groups were assessed for size before and after both treatments.

Result: Corticosteroid treated group showed reduction in size score than laser group

Conclusion: Topical corticosteroids are more effective than LLLT. LLLT may be used as an alternative treatment for symptomatic OLP and when steroids are contraindicated.

KEYWORDS

Topical Corticosteroid, Lichen Planus, Low Level Laser

INTRODUCTION

Lichen planus 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] Approximately 15-35% patients suffering from oral lichen planus were found to be associated with skin lesions.[1,2,5] The cutaneous and oral involvement does not necessarily occurs 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. The cutaneous lesions are presented as flat-topped papules commonly found in wrist, ankles and genital regions sparing the facial.[3] 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 hypoglycaemics, non-steroidal anti-inflammatory drugs, anti-arthritics, xanthine oxidase inhibitors and first generation anti depressants .[7,8]**Low level lasers therapy** has come up now a days as a new treatment modality for oral lichen planus without having significant adverse effects.[5,11] This treatment modality is painless and well tolerated by patients and has achieved clinical improvement in most of the patients .[7,9] It has been found that **Low-level laser therapy (LLLT)** has bio stimulating effects on oral mucosa. It also offers tissue healing by controlling inflammatory and does not show any adverse effects. It also helps in reducing post-surgical pharmacologic treatment. [5]The effects of low-level lasers on tissues are primary or secondary. Primary effects consist of vasodilatation, as well as enhancement of blood flow, It also enhances the cellular metabolism and increases the proliferation of neutrophil and fibroblast. It also increases the pain stimulation threshold. [5,6,7] Other effect consists of aggregation of prostaglandins (prostaglandin E2), immunoglobulins, lymphokines, beta-endorphin and encephalins present in the tissue, which helps in decreasing inflammation, immune response, and pain, respectively.[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. The effect of laser mainly depends on the laser dose used for treatment. [8] Thus, in our study we have taken LLLT for management of patient suffering from oral lichen planus, mainly by reducing the invasiveness present with other therapies.

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(OLP).

OBJECTIVES: -

1. To assess the size, of lesion in OLP before and after treatment with low level laser therapy and topical corticosteroid therapy.
2. To compare the results of size, before and after treatment with low level laser therapy and topical corticosteroid therapy.

MATERIAL AND METHOD:

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. Following parameters were included in the establishment of diagnosis and the following parameters to be satisfied for inclusion in the study.

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 considered.

The OLP was diagnosed clinically and 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 as they implement intraoral inflammation and intensify both extension and symptoms of OLP lesions.

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.

Lesions were divided into two groups by SNOSE method as group A and group B.

Group A (n= 24): Patients were subjected to laser sessions with exposure time of 8 minutes for four successive applications of two minutes each with a gap of 45 seconds in between two applications, the exposure power setting was (0.3 watt), (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. The laser therapies were performed by one operator, another skilled examiner, who was blind to the treatment, recorded the group and size of the lesion. **Group B**(n=24): Patients were trained to apply kenacort gels (0.1% triamcinolone acetonide gel) four times a day for four weeks with weekly follow up . The size of lesion was recorded. And was compared within the groups.

Size of lesion will be scored from 0 to 3 according to area of involvement

0 = no lesion, 1 = lesions <1 cm^2, 2 = lesions from 1 to 3 cm^2, 3 = lesions >3 cm^2

Reduction in the sign scores will be scored according to the sign scoring scale of Thongprasom et al., as follows:

5 = white striae with an erosive area >1 cm^2, 4 = white striae with an erosive area <1 cm^2

3 = white striae with an atrophicarea >1 cm^2, 2 = white striae with an atrophic area <1 cm^2

1 = mild white striae only, 0 = no lesions - normal mucosa

Duration of study - 18 months

The statistical test/s used to analyze the data:- 1. Mann- whitneys U test 2. Wilcoxon sign ranked test

STATISTICALANALYSIS:

After data collection, data entry was done in Excel. Data analysis is done with the help of SPSS software version 21. Qualitative data is presented with the help of frequency and percentage table. Quantitative data is presented with the help of mean, standard deviation, median and IQR. On the basis of normality, the comparison between two treatment groups and grading of size, both before and after treatment is done with the help of Mann-Whitney test. Association among number for patients in each groups and size, both before and after treatment is assessed with the help of chi- square test and Fisher Exact test for 2X2 tables. The comparison of individual before and after treatment is done with wilcoxon Sum Rank test. P value less than 0.05 is taken as significant level.

RESULT:

Patients suffering from oral lichen planus were diagnosed using normal clinical investigation methods consisting of inspection, strectchability test, scrapability test and Lugol's iodine test. Patients were evaluated for size of the lesion. Twenty four patients were included in the study out of which 13 were female and 11 male candidates. All the patients were in between 20-70 year age group.

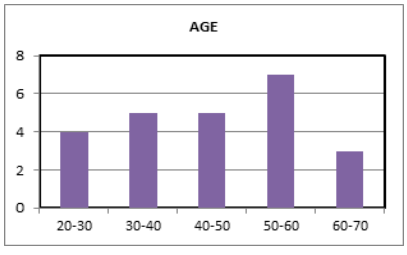

Fig 1 :- AGE DISTRIBUTION

INFERENCE: - maximum number of patients suffering from oral lichen planus ranges from age group 30-60 years.

SIZE OF LESION: TABLE -1:- SIZE OF LESION BEFORE TREATMENT

Size of the lesion Before Treatment	Group A		Group B		Total	p value
	n	Percent	n	Percent		
2	16	66.7%	18	75.0%	34	0.752
3	8	33.3%	6	25.0%	14	
Total	24	100.0%	24	100.0%	48	

TABLE – 2:- SIZE OF LESION AFTER TREATMENT

Size of the lesion After Treatment	Group A		Group B		Total	p value
	n	Percent	n	Percent		
0	1	4.2%	7	29.2%	8	0.000
1	15	62.5%	15	62.5%	30	
2	7	29.2%	2	8.3%	9	
3	1	4.2%	0	0.0%	1	
Total	24	100.0%	24	100.0%	48	

TABLE – 3:- CHANGE IN SIZE OF LESION

Change in Size	Group A		Group B		Total	p value
	n	Percent	n	Percent		
0	4	16.7%	1	4.2%	5	0.042
1	16	66.7%	11	45.8%	27	
2	4	16.7%	12	50.0%	16	
Total	24	100.0%	24	100.0%	48	

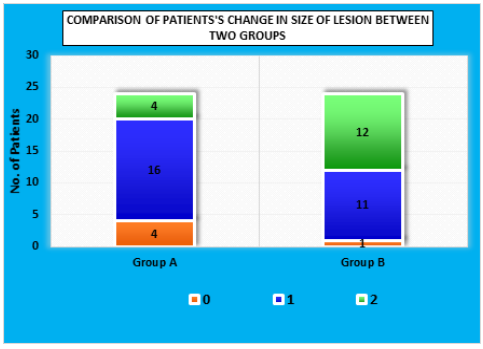

Fig 2: Comparison of patient change in size of lesion between two groups

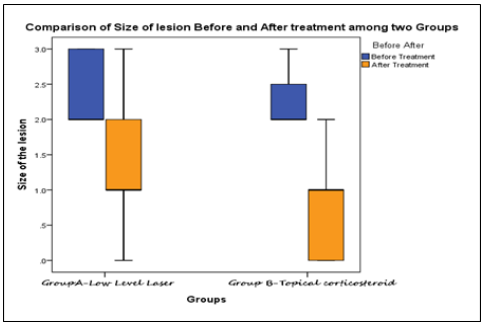

Fig 3: Comparison of size of lesion before and after treatment among two groups

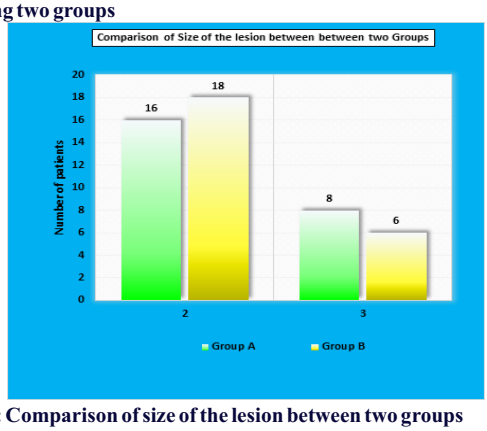

Fig 4: Comparison of size of the lesion between two groups

Table 4: Comparison of median size, amongst group 2 before and after the treatment

Group A	Before treatment			After Treatment			Z (Wilcoxon Sum Ranked Test)	p value
	Mean	Median	SD	Mean	Median	SD		
Size of The Lesion	2.33	2.00	.482	1.33	1.00	.637	-4.179b	0.000

Group B	Before treatment			After Treatment			Z (Wilcoxon Sum Ranked Test)	p value
	Mean	Median	SD	Mean	Median	SD		
Size of The Lesion	2.25	2.00	.442	.79	1.00	.588	-4.326b	0.000

INFERENCES : In this study, the size of lesion was observed to be reduced in both low level laser and corticosteroid group but it was more faster in patients treated with topical corticosteroids than patients treated with low level laser with a wavelength of 660nm at 0.3watt. The highest reduction in size was observed in third week of treatment module in both low level laser and corticosteroid groups.

CONCLUSION: Following conclusions were drawn from the present study. 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 this study we found female predilection was more than male. Out of 24 patients 13 were female whereas 11 were male, Hence, the gender distribution of OLP has more inclination towards females than males. In the current study the buccal mucosa was the most predominant site for OLP accounting for approximately 80% of cases. In this study, reduction in size of lesion was observed in both low level and corticosteroid group but it was faster in patients treated with topical corticosteroids than in patients treated with low level laser with a wavelength of 660nm at 0.3watt. But reduction in size between both the group was not significant. The highest reduction in size was observed in third week of treatment module in both low level laser and corticosteroid groups.

RECURRENCE: In current study the recurrence of lesions were noted after 1 month, 3 months and 6 months of completion of the sessions. Out of 24 patients, 6 patients did not complete remission of symptoms after finishing 10 sessions of low level laser. 2 patients had recurrence after 3 months of treatment and 2 patients had recurrence after 6 months from the completion of treatment with low level laser .Whereas 14 patients in the corticosteroid group did not had complete remission of symptoms after completion 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***. In addition ***low level laser does not exhibit any unwanted adverse effect like candidal overgrowth***. Hence, we conclude that low ***level laser can be considered as an alternative treatment modality with fewer side effects in oral lichen planus patients***. Nevertheless, a more detailed study with larger sample size is needed.

LIMITATIONS: Although the research has reached its aims, there were some unavoidable limitations. First because of the time limit, this research was conducted only on a small size of population. Therefore, to generalize the results for large groups, the study should have involved more participants with different types of oral lichen planus. Second, as oral lichen planus is a systemic disorder, the outcome of treatment depends on the patients systemic conditions as well. However, in our study we have excluded most of the systemic ailments; still stress stands to be major etiologic factor in pathogenesis of lichen planus.

FUTURE SCOPE: As the study was only related to the clinical signs and symptoms , there is further scope to do more studies on the effect of low level laser on tissue, and changes at microbiological level. Also the effect of low level laser treatment can be studied on other oral mucosal lesions. And also, with different power settings and different wave lengths, which can be used in further studies to have better results.

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