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Original Research Article

Comparative Study on Efficacy of Topical Application of Triamcinolone Acetonide and Curcumin in Management of Oral Lichen Planus

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Abstract: ***Introduction*:** Oral lichen planus (OLP) is a chronic inflammatory and immune mediated disease that affects the mucous membranes. OLP is cell-mediated, immune damage to basal keratinocytes that are recognized as being antigenically foreign or altered. Many treatment modalities have been tried since the time immemorial, steroids being the mainstay of the treatment, with more benefits than adversities, but now-a-days alternative/ herbal medicines are used keeping in view the chronicity of disease and long term treatment required to cure it. Curcuminoids, the major constituent of turmeric, has anti-inflammatory, antioxidant and anticancer properties. Natural / herbal product has minimal adversities so this can be more helpful for patients in the upcoming time. ***Aim*:** The study was conducted to compare the efficacy of conventional topical corticosteroid, triamcinolone acetonide 0.1% with 1% curcumin gel in OLP patient and to assess reduction in burning sensation, regression of size and ulcero-erosive appearance of lesion. ***Materials and Methods*:** An intervention study was conducted on 40 patients diagnosed with OLP which were divided into two groups. Group A was provided with Ointment 0.1% triamcinolone acetonide while Group B was provided with 1% curcuma longa extracts gel for local application on the affected regions The results were analysed using Students t-test,discrete (categorical) data were summarised in number (n) and percentage (%) and compared by chi-square (χ^2) test. Groups were also compared by two factor (groups and periods) repeated measure (RM) analysis of variance (ANOVA). ***Results*:** Intragroup comparison showed statistically significant reduction in burning sensation, size and extension of lesion ($p<0.001$) as well as erythema and ulceration ($p<0.001$) in both the groups. In inter-group comparison, Group A showed reduction in burning sensation (97.3%), size and extension of lesion (100%), reduction in erosive pattern (94.7%) and reduction in ulcerative lesion (100%). Group B showed maximum reduction in burning sensation (99%), size and extension of lesion (100%), reduction in ulcero-erosive pattern (100%). ***Conclusion*:** Although triamcinolone brings prompt result but Curcumin oral gel is efficient in bringing clinical improvements; however it cannot be used as a mainstay drug but if used for longer period of time it may bring the required changes.

Keywords: Oral Lichen Planus, Triamcinolone acetonide, Curcumin, Burning sensation, anti-inflammatory, herbal/ alternative drugs.

INTRODUCTION

Oral lichen planus (OLP) is a chronic inflammatory and immune mediated disease that affects the mucous membranes [1]. Most common sites are buccal mucosa, tongue and gingiva but palatal lesions are uncommon. Usual presentation is bilateral lesions or multiple lesions in the mouth. Oral lichen planus is divided into six types: reticular, papular, plaque-like, erosive, atrophic, and bullous. The reticular, papular and plaque-like forms are usually painless and appear clinically as white keratotic lesions. The erosive,

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atrophic and bullous forms are often associated with a burning sensation and in many cases can cause severe pain [2]. The erosive or ulcerative form often occurs in association with desquamative gingivae with interlacing diffuse white striations. The prevalence of oral lichen planus (OLP) is relatively low (0.5% to 2.5%), being mainly associated with adult females at a ratio of 2:1, usually emerging in the 4th to 5th decade of life [3]. In OLP there is chronic, cell-mediated, immune damage to basal keratinocytes in the oral mucosa that are recognized as being antigenically foreign or altered [4].

Oral Lichen Planus is regarded as a psychosomatic disorder. Although various treatments have aimed to improve the lesions and reduce the associated pain, corticosteroids are the mainstay and most common drug for OLP. Trend towards drugs of natural or herbal origin (alternative therapy) with antioxidant and anti-inflammatory properties, with or without corticosteroids, have been considered for the treatment of OLP [5]. Curcuminoids, the major constituent of turmeric, has anti-inflammatory, antioxidant and anticancer properties. Curcumin tones down the inflammatory response by depressing the activity of Cycloxygenase-2 (COX-2), lipoxygenase and inducible Nitric-Oxide Synthase enzymes (iNOS). Natural / herbal product has minimal adversities so this can be more helpful for patients in the upcoming time.

MATERIAL & METHOD

Study Design & Population

This prospective interventional study was carried out in the Department of Oral Medicine and Radiology, Career Post Graduate Institute of Dental Sciences & Hospital, Lucknow, U.P., India, during January 2021 to October 2022. Ethical clearance was obtained from the Institutional Ethical Committee and informed consent was taken from all the participants of the study. The subjects consisted of 40 patients who were selected randomly among the out patients attending the department and were diagnosed clinically with OLP. The inclusion and exclusion criteria have been listed in [Table 1].

Table 1: Inclusion and exclusion criteria

Inclusion Criteria:	Exclusion Criteria:
Clinically confirmed cases of OLP.	Individuals with known history of hypersensitivity to triamcinolone and curcumin.
Age from 20-70 years.	Individuals with any known systemic disorders.
Patients who were willing to participate in the study.	Individuals under any drugs like anti-cholinergic, diuretics, antihistamines, anti-hypertensive, & psychoactive substance.
Patients with symptomatic oral lichen planus i.e., burning sensation and who had not under gone any previous treatment for the same in the last six months	Patients who had received prior treatment for OLP were excluded.

METHODOLOGY

All the patients meeting the eligibility criteria were interviewed and examined in the dental clinic and their data was recorded in a standard case sheet proforma. The selected 40 patients were allocated into two groups of 20 subjects each by simple randomization. Members of Group A were provided with Ointment kenacort oromucosal paste (0.1% triamcinolone acetonide) which is manufactured by Abott Healthcare Pvt. Ltd. in India. Group B was provided with 1% curenext gel (curcuma longa extracts) which is manufactured by Abott India Ltd. Patients were advised to wash their hands and rinse their mouth then the ointment was applied on the affected regions three times a day, and they were recalled on every 15 days to evaluate the regression of the lesion. Patients were also advised not to rinse their mouth or take water or food for 30 minutes after application of the ointment. Patients were periodically recalled for follow up for a period of minimum three months. The parameters taken under account were consecutively measured and checked for from time to time. Intensity of Burning sensation was measured on numerical VAS Scale (Visual analogue scale) from 0- 10, with 0 being no burning and 10 being the worst burnng sensation. The size and extent of the lesion was assessed for regression by scoring pattern given by Thongprasom sign score for OLP [Table 2] [6]. Scoring was done for Erythema and ulceration of the lesion, keeping MOMI index under consideration developed by Schubert MM *et al.*, [Table 3] [7]. Patients were enquired about any adverse drug reactions during the study period.

Table 2: Thongprasom sign scoring criteria

Sign	Definition
Score 5	White striae with erosive area > 1 cm^2
Score 4	White striae with erosive area < 1 cm^2
Score 3	White striae with atrophic area > 1 cm^2
Score 2	White striae with atrophic area < 1 cm^2
Score 1	Mild white striae only
Score 0	No lesion, normal mucosa

Table 3: Modified oral mucositis index – scoring criteria

Score for erythema		Score for Ulceration	
Intensity	**Interpretation**	**Intensity**	**Interpretation**
0	Normal	0	No ulcerations
1	Mild erythema	1	Between 0-0.25 cm2
2	Moderate erythema	2	Between 0.25-1 cm2
3	Severe erythema	3	1.0 cm2 or greater

Statistical Analysis

All the collected data were subjected to statistical analysis. Discrete (categorical) data were summarised in number (n) and percentage (%) and compared by chi-square (χ^2) test. A two-tailed (α=2) $P < 0.05$ was considered statistically significant. Analysis was performed on SPSS software. The baseline NRS Score, Thongprasom sign score and MOMI score as well as post treatment NRS Score, Thongprasom sign Score and MOMI Score were compared using repeated measure (RM) analysis of variance (ANOVA) and the significance of mean difference within (intra) and between (inter) the groups was done by Tukey's HSD (honestly significant difference) post hoc test.

RESULTS

The age of patients in Group A and B respectively i.e. ointment triamcinolone acetonide and ointment curcumin ranged from 20-58 and 21-60 yrs respectively with mean (± SD) 37.85 ± 12.34 and 35.05 ± 11.56 yrs respectively and median 36 and 32.5 yrs respectively. The demographic characteristics (age and sex) of patients of two groups is summarised in Table 4.

Table 4: Demographic characteristics of two groups

Demographic characteristics	**Group: A Triamcinolone Acetonide (n=20) (%)**	**Group: B Curcumin (n=20) (%)**	**t/χ^2 value**	***P*-Value**
Age (yrs)	37.85 ± 12.34	35.05 ± 11.56	0.721	0.475
Sex: Female Male	 15 (75.0) 05 (25.0)	 13 (65.0) 07 (35.0)	 0.474	 0.491

The net mean decrease (i.e. mean change from pre-treatment to 90th day) in BS (Burning sensation) score of curcumin group was (99.00%) was found 1.70% higher as compared to triamcinolone group (97.30%) (Fig. 1).

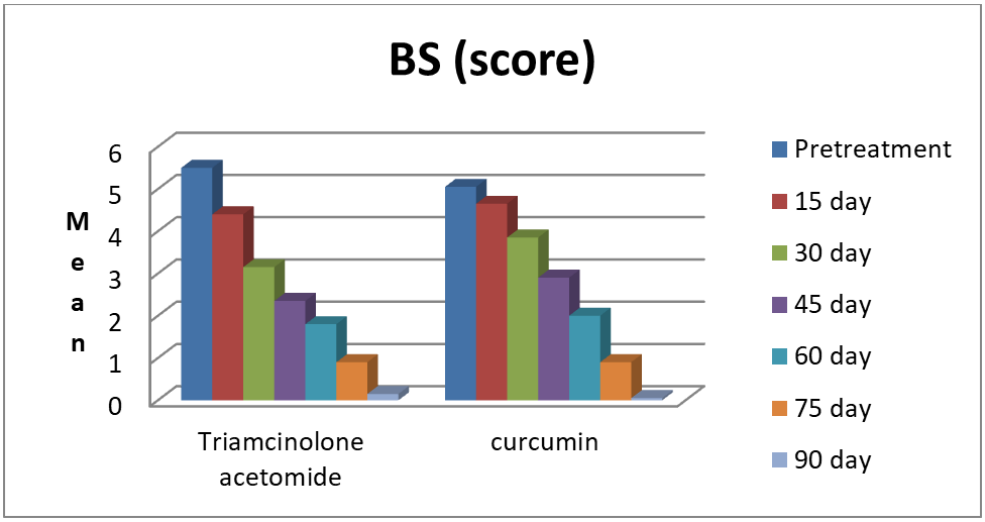


Fig. 1: For each group, comparisons of difference in mean BS score between the periods

The net mean decrease (i.e. mean change from pre-treatment to 90th day) in SE (Size and Extension) score of both the groups were 100% (Fig. 2).

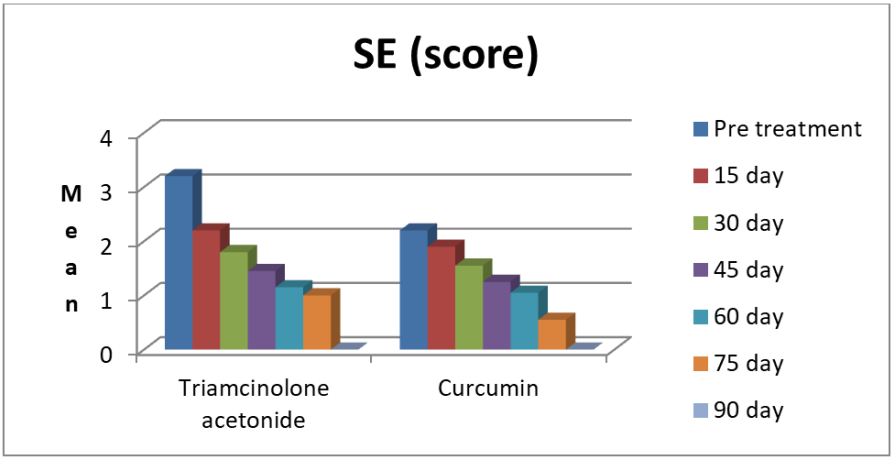


Fig. 2: For each group, comparisons of difference in mean SE score between the periods

The net mean decrease in ER (Erythema) score of curcumin group was (100.00%) was found 5.26% higher as compared to triamcinolone group (94.74%) (Fig. 3).

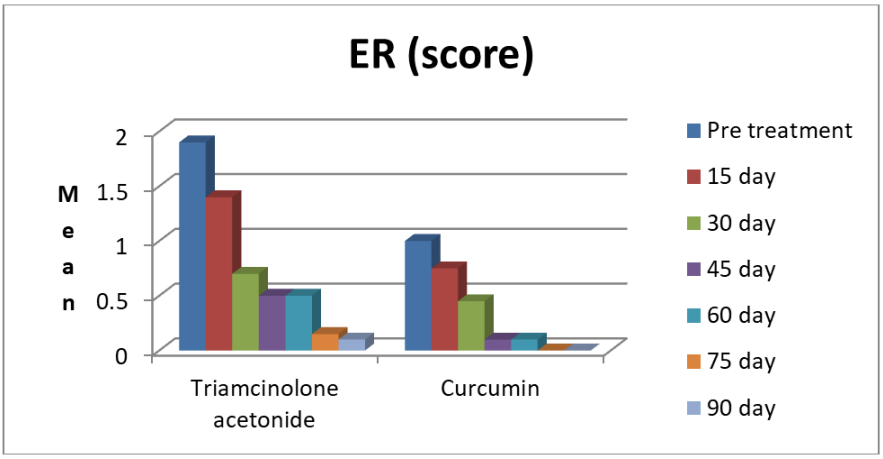


Fig. 3: For each group, comparisons of difference in mean ER score between the periods

The net mean decrease in UL (Ulceration) score of both the groups was (100.00%) (Fig. 4).

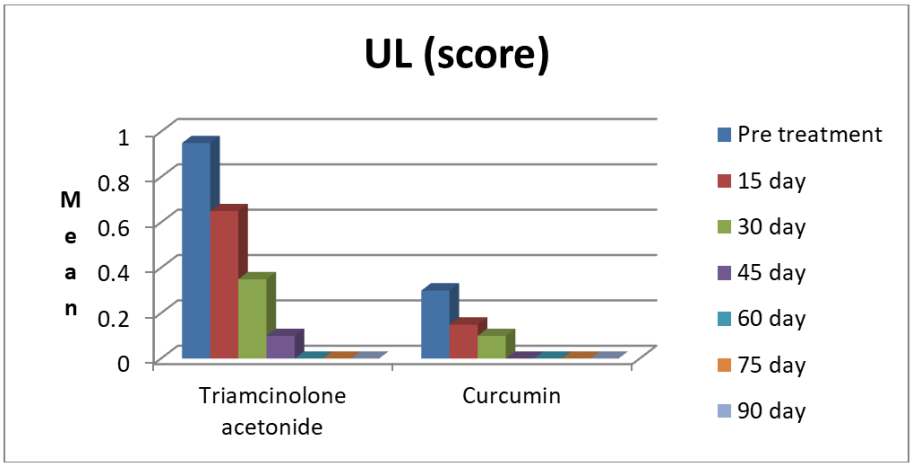
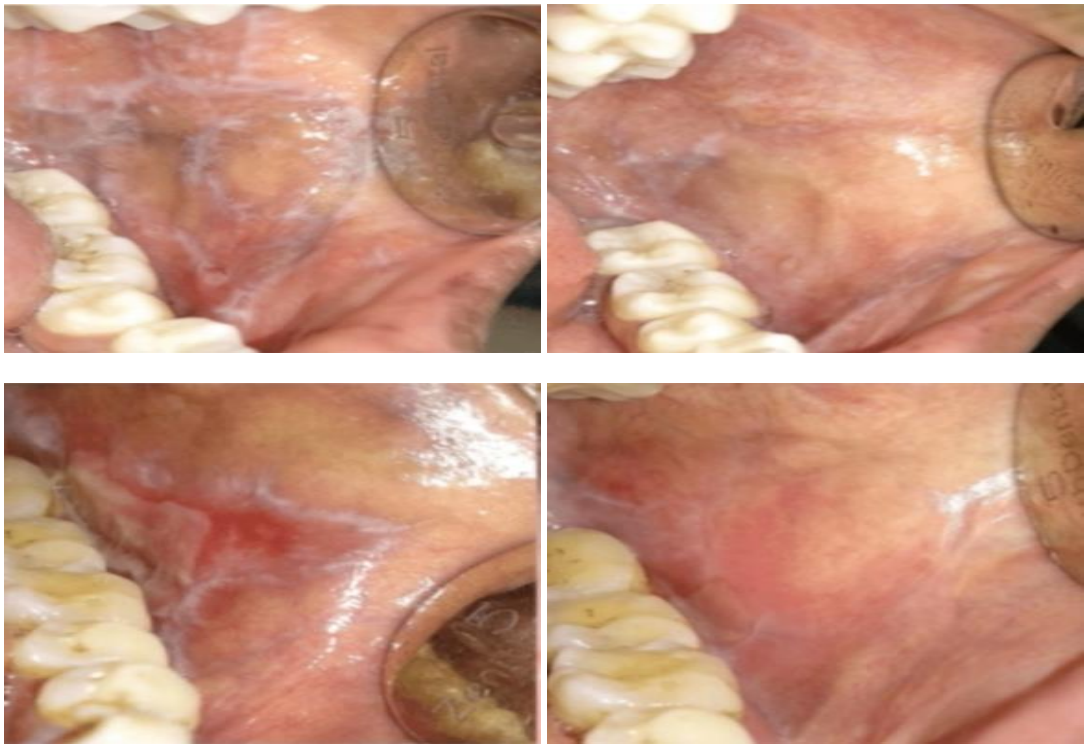


Fig. 4: For each group, comparisons of difference in mean UL score between the periods



(PRE) **(POST)**

Fig. 5: Pre-treatment and Post treatment OLP of buccal mucosa

DISCUSSION

Lichen planus is a comparatively common, mucocutaneous disorder that is mediated immunologically. It is chronic in occurrence, with periods of exacerbations and remission [8].

Corticosteroids have been the mainstay of treatment but now a days natural/ herbal treatment modalities are also being tried to reduce the side effects of steroids. Curcumin is extracted from *Curcuma* plant, which is the main combination of turmeric root its anti-inflammatory, antioxidant, and antineoplastic properties helps in treating and reducing the symptoms of OLP [9]. The present study compares the efficacy of 0.1% triamcinolone acetonide ointment and 1% curcumin gel in management of OLP patients. The prevalence of oral lichen planus (OLP) mainly associated with adult females at a ratio of 2:1 (female : male), usually emerging in the 4th to 5th decade of life [10]. In this study among the patients in Triamcinolone group there were 15 female patients (75%) and 05 male patients (25%) while in the curcumin group 13 female patients (65%) and 07 male patients (35%) were found. Thus in both the groups female predominance was seen. Comparing the mean age of two groups, Student's t test showed similar ($P > 0.05$) age between the two groups i.e. did not differ significantly. Similarly, comparing sex proportion (F/M) of two groups, χ^2 test showed similar ($P > 0.05$) sex proportion between the two groups i.e. also not differ significantly. The most common site was bilateral buccal mucosa followed by unilateral buccal mucosa, tongue, floor of the mouth and vestibular regions. Furthermore, the most common pattern of OLP encountered was Reticular type (65%) followed by erythematous type (27.5%), plaque type (1.25%), papule type (1.25%) and ulcerative type (1.25%). Burning sensation is the most common representation among the patients of OLP. At final evaluation, the net mean decrease (i.e. mean change from pre- treatment to 90th day) in BS score of curcumin group was (99.00%) was found 1.70% higher as compared to triamcinolone group (97.30%). The findings of this study coincided with the findings of Singh V *et al.,* in 2013 [11]. Prasad S *et al.,* in 2014 performed a study in which herbal curcumin therapy was planned which showed improvement in the condition thus in this study curcumin is found to be an effective treatment in oral lichen planus as in our study [12]. The second parameter taken in our study is the reduction in size and extension of lesion, the scoring of size is done by the soring pattern given by Thongprasom K [6]. At final evaluation, the net mean decrease (i.e. mean change from pre- treatment to 90th day) in SE score of both the groups was 100%. In 2017 *Thomas AE* et al., selected 75 patients where Curcumin showed reduction in sign and symptoms along with relief from burning sensation, but the group treated with steroid had shown better results and regression of lesion [13]. This result differed from our study where both curcumin and triamcinolone regressed the size of lesion equally. The result of our study was similar to the study done by Biswas S *et al.,* in 2018 where 12 patients in study group and 10 patients in control group showed complete remission with respect to the appearance score. No statistically significant difference was noted

between the two groups [14]. Erythema is the most common representation among the patients of OLP and is caused along with epithelial atrophy. Scoring pattern used in our study was given by M.M. Schubert under MOMI (Modified Oral Mucositis Index) indexing system for OLP [7]. At final evaluation, the net mean decrease (i.e. mean change from pre-treatment to 90th day) in ER score of curcumin group was (100.00%) was found 5.26% higher as compared to triamcinolone group (94.74%). Keshari D *et al.,* in 2015 conducted a controlled trial on 27 adult OLP patients. The control group (n = 12) was treated with triamcinolone acetonide 0.1% and the study group (n = 15) with commercially available topical curcumin ointment. The comparison showed significant improvement in the erythema (P = 0.002) [15]. This result is similar to the result found in our study. The last parameter taken in the present study is ulceration. Scoring pattern used in our study was given by M.M. Schubert under MOMI (Modified Oral Mucositis Index) indexing system for OLP [7]. At final evaluation, the net mean decrease (i.e. mean change from pre-treatment to 90th day) in UL score of both the groups was (100.00%). Keshari D *et al.,* in 2015 conducted a controlled trial on 27 adult OLP patients. The control group (n = 12) was treated with triamcinolone acetonide 0.1% and the study group (n = 15) with commercially available topical curcumin ointment. The comparison showed significant improvement in the erythema (P = 0.002), but non-significant reduction in pain (P = 0.697), and ulceration (P = 0.291) in the study group as compared to the control group. Curcumin fared better in reducing pain, erythema, and ulceration [15]. Singh V *et al., in* 2013 reported that turmeric in the ointment on local application twice/day for a period of 3 months showed improvement in clinical symptoms like Burning sensation, in tolerance to spicy food, reduction in redness, ulcerations and Striae [11]. These findings were similar to the result found in our study.

CONCLUSION

The results which were obtained at the commencement of this study shows that curcumin being a natural/herbal product relieves burning sensation and regresses the size and extension of lesion but when erythema and ulcerations are taken into consideration triamcinolone acetonide showed better and early healing. Although curcumin shows less side effect yet corticosteroid remains the mainstay in managing OLP patients. Curcumin can better be used for initial smaller lesion of OLP. Also, long term steroid application as a part of maintenance regime would result in side effects which can be minimized by keeping the patient on natural products like curcumin oral gel. Both the drugs (triamcinolone acetonide and curcumin) have shown promising result, the compulsory requirement is patient's due compliance, regular follow ups, timely application of medicaments. Less documented data is known on the use of curcumin and its comparison with a long and firm standing steroid in OLP cases. More studies and researches are still needed to be done and conducted for longer duration and larger population to know the recurrence of disease and for its significance to be legitimize.

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