Research Article

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Effect of Systemic and Topical Forms of Curcumin with Conventional Multivitamin tablets in the Treatment of Oral Submucous Fibrosis

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ABSTRACT

Background: Oral submucous fibrosis (OMSF) is a premalignant condition disease of oral mucosa, and has high malignant potential. Many treatment modalities have been tried since years but none have proved to be completely effective and curative. Turmeric has been proved a number of medicinal properties. Turmeric with its active ingredient, "curcumin" are being studied as chemo-preventive agents in India and abroad as treatment modality in various chronic insidious diseases such as OSMF. This study was planned to assess the efficacy of curcumin in patients with OSMF and associate it with conventional treatment such as multivitamin and antioxidant tablets.

Materials and Methods: A total of 40 patients who were clinically and histopathologically confirmed as having OSMF were selected and randomly divided into four groups. Patients were recalled every 20 days for 8-9 weeks and results were scrutinized using exploration of variance test. Patients were treated with Tablets, capsules, and oil which were factory-made for the treatment purpose.

Results: A significant improvement was seen in patients under treatment with curcumin when compared to those of another group.

Conclusion: Curcumin as a treatment modality is effective, useful, and economic in OSMF. Further studies are needed to confirm this treatment modality.

Keywords: Curcumin, multivitamins, oral submucous fibrosis.

INTRODUCTION

Oral submucous fibrosis (OSMF) has been mentioned in the Indian medical literature since the time of Sushruta and termed as Vidari.[1] It is defined as "An insidious chronic disease disturbing the mucosa or any part of oral cavity and occasionally extending into the pharynx and esophagus.[2] OSMF is occasionally preceded by and/or associated with vesicle formation trismus and inability to eat.[3] Epidemiological studies show unique prevalence of this premalignant condition in India and Southeast Asia.[4] The malignant transformation rate for OSMF is 7%–30%.[5] A wide range of management modalities, both medical and surgical, has been suggested but none have been showed promising result, hence search of an effective treatment modality still remains.[6] Plants have a key foundation of medicinal use. Turmeric has been accredited a number of remedial properties.

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Turmeric and its active ingredient, "curcumin," are being planned as chemo preventive agents in India and abroad. Curcumin and its oil have been found to prevent many ailments through their anti-inflammatory, antioxidant, and anticancer properties.[7]

This study is planned to assess the efficacy of numerous forms of curcumin in patients with OSMF and to relate it with conventional treatments such as multivitamin and antioxidant tablets.

MATERIALS AND METHODS

A total of 40 patients who were clinically and histo-pathologically confirmed as having OSMF were selected for the present study. Patients clinically having OSMF were selected based on the inter-incisal distance as Group A, B, C, and D. These patients were randomly divided into four groups consisting of 10 patients in each group. Tablets, capsules, and oil were factory-made for the treatment purpose and given to the patients randomly divided into four groups. Group I patients were prescribed Curcumin tablets, Group II were given Curcumin capsules, Group III were given Curcumin oil, and Group IV was control group (Multivitamin Tablets). All the groups were divided according to mouth opening criteria by Lai DR classification:

Group A: >35 mm
Group B: Between 30 to 35mm
Group C: Between 20 to 30mm
Group D: < 20mm

Group I to IV were categorized rendering to treatment modality:

Group I: Curcumin tablet
Group II: Curcumin capsules
Group III: Curcumin oil
Group IV: Control group (Multivitamin tablets)

Along with this treatment, all patients were also given overall advices to quit habit, eat green leafy vegetables, avoid spicy food, and do mouth-opening exercise with ice cream sticks. A packet containing 45 tablets each of curcumin (350 mg) was given to the patients in Group I and they were instructed to take tablets thrice daily for 15 days. A packet containing 30 capsules each of curcumin (500 mg) was given to the patients in Group II and they were instructed to take capsules twice daily for 15 days. Oil of curcumin (10 mL) was given to Group III patients and they were instructed to apply topically for 15 min twice daily and avoid eating and drinking for half an hour after application. A packet containing 30 Multi vitamin tablets (500 mg) each was given to the patients in Group IV and they were instructed to take these tablets twice daily for 15 days. The patients were instructed to report every 15-20 days during the follow-up of 2 more visits till 60 days, and the change was noted in the severity of burning sensation, mouth opening, tongue protrusion, and cheek flexibility in all four groups from the starting till the end of the management, and then the results were assessed using analysis of variance test.

RESULTS

None of the volunteers reported any allergy or uncharacteristic reaction or any indications of harmfulness to the treatment modality. Among all groups the mean of tongue protrusion by the end of 8-week Curcumin give significant improvement. The mean difference obtained of capsule and oil was 0.36 and of tablet was 0.26, which is significant as compared to that of control group, which was 0.12 [Table 1].

The patients in Group IV displayed slight improvement when related to those in the other three groups, whereas better results with burning sensation was observed in Group III patients. After a follow –up of 8 weeks there is statistically significant increase in the mouth opening of patients of Group I, II, and III compared to that of control Group.

The clinical scores of OSMF in patients of the four groups were noted before the treatment and at every visit during the treatment and follow-up. A remarkable reduction in the clinical scoring of the patients of Group I, II, and III was observed after first 15 days of the treatment.

DISCUSSION

After 8 weeks of treatment and regular follow up, the patients in Group I, II, and III showed prudent improvement compared to that in control group for tongue protrusion, burning sensation, and mouth opening Oil showed better results in the reduction and improvement of burning sensation, whereas

capsules showed good improvement in the score of mouth opening and tongue protrusion. Therefore, it can be quantified that turmeric in all formulae is a superior treatment modality in improving signs and symptoms of OSMF.

Table 1: Mean of comparison of tongue protrusion in 8 weeks (n =40).

	Group I	Group II	Group III	Group IV
No of Patients	(n=10)	(n=10)	(n=10)	(n=10)
Baseline	2.5 ± 0.9	3.9 ± 0.7	3.6 ± 0.6	3.8 ± 0.6
2 weeks	2.6 ± 0.8	4.0 ± 0.7	3.7 ± 0.6	3.8 ± 0.6
4 weeks	2.7 ± 0.7	4.1 ± 0.6	3.8 ± 0.6	3.8 ± 0.6
6 weeks	2.8 ± 0.7	4.2 ± 0.7	3.9 ± 0.5	3.9 ± 0.6
8 weeks	2.8 ± 0.7	4.2 ± 0.7	3.9 ± 0.5	3.9 ± 0.6
Difference of mean	0.26	0.36	0.35	0.12
p value	0.779	0.768	0.774	1.07

The increase in mouth opening and tongue protrusion carried about by the treatment could be an effect of the anti-inflammatory, antioxidant, and fibrinolytic belongings of curcumin and turmeric oil. Curcumin has antifibrotic effect and on type I and III collagens are the main components of extracellular matrix (ECM). A reduction in the deposition of ECM is of great position in the treatment of OSMF. By inhibiting the proliferation and inducing apoptosis of myofibroblasts, curcumin effectively decreases the generation of type I and III collagens, confirming its potential therapeutic value in OSMF.[8] pathological observations of curcumin in animal model shows profound antitumorigenic and antimutagenic activity.[4]

Turmeric has been designated as a dual inhibitor of arachidonic acid metabolism as it impedes both cyclooxygenase and lipoxygenase pathways of inflammation thus inhibiting the products of inflammation such as prostaglandins and leukotrienes[9] biological activities of curcumin are pro-oxidant, antioxidant, analgesic, anti-inflammatory, antiseptic, anti-proliferative, anti -mutagenic, antimicrobial, neuroprotective, immunomodulatory, and anticarcinogenic.[9–11] Weakening of reactive oxygen species (ROS) by curcumin has been showed, which occurs through its collaboration with thioredoxin reductase, thus altering its action to nicotinamide adenine dinucleotide phosphate oxidase, which could lead to production of ROS.[12] It is known to scavenge superoxide anion radicals and hydroxyl radicals

Generated by triggered macrophages, which play an important part in inflammation. The antioxidant activity of curcumin could be arbitrated through anti- oxidant enzymes such as superoxide dismutase, catalases, and glutathione peroxidase. A study by Rai *et al.*[13] did a study on the action mechanism for curcumin in precancerous lesions based on serum and salivary markers of oxidative stress concluded that curcumin significantly increases the overall antioxidant status and the levels of vitamins C and E and decreases lipid peroxidation and DNA damage of patients. So, the effects brought about by the treatment regime of numerous curcumin products could be a synergism of their anti-inflammatory and antioxidant properties.

CONCLUSION

From the present study it can be established that those patients who treated with multivitamin tablets barely showed any enhancement in the signs and symptoms. It can be concluded that turmeric is a safe, nontoxic, and an effective substitute for many conventional drugs because of its distinguished therapeutic and medicinal properties and multiple effects on various systems of the body. However, not enough information and research is available in this field, and therefore continuous further research is required to determine the effect of curcumin and its application in oral sub mucous fibrosis and other potential malignant oral conditions.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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