

ORIGINAL RESEARCH

Efficacy of Curcumin in the Management of Oral Submucous Fibrosis

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ABSTRACT

Background: The present study was conducted to assess the efficacy of curcumin in the management of Oral Submucous Fibrosis (OSF). **Material and methods:** 50 clinically diagnosed patients with OSF who ranged in age from 18 to 50 years and had an interincisal opening between 15 and 30 mm were chosen. One month before the start of treatment, the patients were urged to give up all tobacco and areca usage habits. 30 of the 50 cases were men and 20 were women. Before starting a medication regimen for the trial, all 50 subjects were requested to stop all behaviours connected to tobacco and areca use as well as any OSF treatments for a period of one month. The subjects were assessed based on the baseline assessment criteria, which measured the patient's state at the beginning of the study and would be reassessed at further study visits. Out of 50, 25 subjects had been given curcumin for treatment and other 25 subjects had been treated with topical steroid application and were called as the control group. Statistical analysis was conducted using SPSS software. **Results:** The inter-incisal distance at baseline, 3 months, 6 months and 9 months in steroid group was 25.47+1.26, 27.11+1.14, 28.32+1.09 and 29.64+1.00, respectively. The interincisal distance at baseline, 3 months, 6 months and 9 months in curcumin group was 23.69+2.19, 29.23+1.56, 30.75+1.98 and 31.78+2.45, respectively. **Conclusion:** Curcumin administration as compared to steroid application proved to be a better treatment approach for OSMF.

Keywords: OSMF, Curcumin, Steroid, Treatment.

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INTRODUCTION

Oral submucous fibrosis (OSF) is a chronic disease that produces scars, tissue fibrosis, and precancerous lesions. It frequently occurs in the buccal mucosa.^{1,2} Pathological characteristics include chronic inflammation, excessive collagen deposition in the connective tissues below the oral mucosal epithelium, local inflammation in the lamina propria or deep connective tissues, and degenerative changes in the muscles. OSF patients experience a severe burning sensation in the mouth after ingesting spicy foods. Other symptoms of OSF include dry mouth, pain, taste disorders, restricted tongue mobility, trismus, dysphagia, and altered tone.

This disease contributes significantly to mortality because of its high malignant transformation rate (1.5–15%).³ The incidence of OSF differs with ethnicity and region and is closely associated with diet, habits, and culture.^{4,6} India has the greatest number of OSF patients worldwide but the disease also occurs in Taiwan and other Asian countries.^{7,8} There are also numerous OSF patients in South Africa as this country has many Indian immigrants.

According to World Health Organization (WHO) statistics, there are >5 million OSF patients globally.^{9,10}

SMF was first described by Schwartz in 1952, where it was classified as an idiopathic disorder by the term atrophialdiopathica (tropica) mucosae oris.¹¹ Since then, many hypotheses are being suggested that OSMF is multifactorial in origin with etiological factors are areca nut, capsaicin in chilies, micronutrient deficiencies of iron, zinc, and essential vitamins. Autoimmune etiological basis of disease with demonstration of various autoantibodies with a strong association with specific human leukocyte antigen (HLA) antigens has also been suggested.¹² This study was conducted to assess the efficacy of curcumin in the management of Oral Submucous Fibrosis.

MATERIAL AND METHODS

50 clinically diagnosed patients with OSF who ranged in age from 18 to 50 years and had an interincisal opening between 15 and 30 mm were chosen. OSF was diagnosed based on reduction in interincisal

distance on maximum mouth opening and palpable fibrous bands involving oral mucosa. One month before the start of treatment, the patients were urged to give up all tobacco and areca usage habits. 30 of the 50 cases were men and 20 were women. Before starting a medication regimen for the trial, all 50 subjects were requested to stop all behaviours connected to tobacco and areca use as well as any OSF treatments for a period of one month. The

subjects were assessed based on the baseline assessment criteria, which measured the patient's state at the beginning of the study and would be reassessed at further study visits. Out of 50, 25 subjects had been given curcumin for treatment and other 25 subjects had been treated with topical steroid application and were called as the control group. Statistical analysis was conducted using SPSS software.

RESULTS

Table 1: Statistics for interincisal distance on maximum mouth opening (IIO) in test and control group

Group	Baseline	3 months	6 months	9 months
Control group (Steroid)	25.47±1.26	27.11±1.14	28.32±1.09	29.64±1.00
Test group (Curcumin)	23.69±2.19	29.23±1.56	30.75±1.98	31.78±2.45

The inter-incisal distance at baseline, 3 months, 6 months and 9 months in steroid group was 25.47±1.26, 27.11±1.14, 28.32±1.09 and 29.64±1.00, respectively. The interincisal distance at baseline, 3 months, 6 months and 9 months in curcumin group was 23.69±2.19, 29.23±1.56, 30.75±1.98 and 31.78±2.45, respectively.

DISCUSSION

The treatment of OSF especially medicinal remains enigma. Corticosteroids have been found to be the medicine of choice by professionals. Turmeric (*Curcuma longa*) is a medicinal plant extensively used in Ayurveda, Unani and Siddha medicine as a home remedy for various diseases.¹³ A large number of studies have revealed that Curcumin has wide therapeutic actions such as anti-inflammatory, antioxidant and anticancer properties.¹⁴ Curcumin have been studied for treatment of OSF by Hastak et al.¹⁵, Chainani-Wu et al. (2008), Das et al.¹⁶ and Rai et al.¹⁷ The present study aims to determine the efficacy of curcumin in the treatment of OSF and compare this to one of the available standard noninvasive drug treatment as topical application of corticosteroid such as clobetasol propionate (0.05%). This study was conducted to assess the efficacy of curcumin in the management of Oral Submucous Fibrosis.

In this study, the inter-incisal distance at baseline, 3 months, 6 months and 9 months in steroid group was 25.47±1.26, 27.11±1.14, 28.32±1.09 and 29.64±1.00, respectively. The interincisal distance at baseline, 3 months, 6 months and 9 months in curcumin group was 23.69±2.19, 29.23±1.56, 30.75±1.98 and 31.78±2.45, respectively. Hazarey VK et al.¹⁸ determined the efficacy of curcumin in the treatment of OSF. Thirty clinically diagnosed OSF patients were divided into two groups, 15 patients in each group from the Outpatient Department. Test group patients were treated with Longvida (curcumin) lozenges and control group with Tenovate ointment (clobetasol propionate (0.05%). The treatment was given for 3 months duration and follow-up was done for 6 months. Both the groups were advised for physiotherapy exercises by mouth exercise device. The baseline and follow-up results were compared for IIO (interincisal distance on maximum mouth opening), Visual Analogue Scale (VAS) for normal food and VAS for spicy food. The test group showed 5.93 (±2.37) mm increase in mouth opening compared

to 2.66 (±1.76) mm of the control group. In relation to VAS scale with spicy and normal food the average reduction was 64 (42-73) and 77 (70.5-82) as compared to 34 (14.5-64.5) and 64 (46-75.5) respectively in control group. The test group results achieved in the treatment span was sustained in the follow-up ($P < 0.05$) compared to control group which showed statistically significant ($P < 0.05$) relapse. It can be concluded that combination strategies for the management of OSF which include the stoppage of causative ill habits, appropriate medicinal and physiotherapy management is more efficient than single therapeutic modality. It is evident from the study that curcumin holds good promise in the treatment of OSF in future. Ingle E et al analyzed the efficacy of turmeric in managing OSMF based on the available literature. The articles were searched from Medline/PubMed and Journal of web, which were published from 2000 to 2019 and reviewed for the determined outcomes. The review showed a positive response for turmeric usage in managing OSMF, in terms of improved mouth opening and decreased burning sensation. Multicenter studies in high incidence countries with long-term follow-up are recommended to better understand the curative aspect of curcumin in OSMF.¹⁹

CONCLUSION

Curcumin administration as compared to steroid application proved to be a better treatment approach for OSMF.

REFERENCES

- Dionne K.R., Warnakulasuriya S., Zain R.B., Cheong S.C. Potentially malignant disorders of the oral cavity: Current practice and future directions in the clinic and laboratory. *Int. J. Cancer.* 2015;136:503–515.
- Chole R.H., Gondivkar S.M., Gadail A.R., Balsaraf S., Chaudhary S., Dhore S.V., Ghonmode S., Balwani S., Mankar M., Tiwari M., et al. Review of drug treatment of oral submucous fibrosis. *Oral Oncol.* 2012;48:393–398.

3. Wang Y.Y., Tail Y.H., Wang W.C., Chen C.Y., Kao Y.H., Chen Y.K., Chen C.H. Malignant transformation in 5071 southern Taiwanese patients with potentially malignant oral mucosal disorders. *BMC Oral Health*. 2014;14:99.
4. Zhang X., Reichart P.A. A review of betel quid chewing, oral cancer and precancer in Mainland China. *Oral Oncol*. 2007;43:424–430.
5. Tilakaratne W.M., Ekanayaka R.P., Warnakulasuriya S. Oral submucous fibrosis: A historical perspective and a review on etiology and pathogenesis. *Oral Surg. Oral Med. Oral Pathol. Oral Radiol.* 2016;122:178–191.
6. Chattopadhyay A., Ray J.G. Molecular pathology of malignant transformation of oral submucous fibrosis. *J. Environ. Pathol. Toxicol. Oncol*. 2016;35:193–205.
7. Chang M.C., Chiang C.P., Lin C.L., Lee J.J., Hahn L.J., Jeng J.H. Cell-mediated immunity and head and neck cancer: With special emphasis on betel quid chewing habit. *Oral Oncol*. 2005;41:757–775.
8. Cox S.C., Walker D.M. Oral submucous fibrosis. A review. *Aust. Dent. J.* 1996;41:294–299.
9. Nigam N.K., Aravinda K., Dhillon M., Gupta S., Reddy S., Srinivas Raju M. Prevalence of oral submucous fibrosis among habitual gutkha and areca nut chewers in moradabad district. *J. Oral Biol. Craniofac. Res*. 2014;4:8–13.
10. Gottipamula S., Sundarajan S., Moorthy A., Padmanabhan S., Sridhar K.N. Buccal mucosal epithelial cells downregulate CTGF expression in buccal submucosal fibrosis fibroblasts. *J. Maxillofac. Oral Surg*. 2018;17:254–259.
11. Tilakaratne WM, Klinikowski MF, Saku T, Peters TJ, Warnakulasuriya S. Oral submucous fibrosis: Review on aetiology and pathogenesis. *Oral Oncol*. 2006;42:561–8.
12. Rajalalitha P, Vali S. Molecular pathogenesis of oral submucous fibrosis-A collagen metabolic disorder. *J Oral Pathol Med*. 2005;34:321–8.
13. Chattopadhyay I, Biswas K, Bandyopadhyay U, Banerjee RK. Turmeric and curcumin: Biological actions and medicinal application. *Curr Sci*. 2004;87:10.
14. Kohli K, Ali J, Ansari MJ, Raheman Z. *Educ Forum*. Vol. 37. Curcumin; 2005. Curcumin: A natural antiinflammatory agent; pp. 141–7.
15. Hastak K, Jakhi SD, More C, John A, Ghaisas SD, Bhide SV. Therapeutic response to turmeric oil and turmeric oleoresin in oral submucous fibrosis patient. *Amala Res Bull*. 1998;18:23–8.
16. Das AD, Balan A, Sreelatha KT. Comparative study of the efficacy of curcumin and turmeric oil as chemopreventive agents in oral submucous fibrosis: A clinical and histopathological evaluation. *J Indian Acad Oral Med Radiol*. 2010;22:88–92.
17. Rai B, Kaur J, Jacobs R, Singh J. Possible action mechanism for curcumin in pre-cancerous lesions based on serum and salivary markers of oxidative stress. *J Oral Sci*. 2010;52:251–6.
18. Hazarey VK, Sakrikar AR, Ganvir SM. Efficacy of curcumin in the treatment for oral submucous fibrosis - A randomized clinical trial. *J Oral MaxillofacPathol*. 2015 May-Aug;19(2):145-52.
19. Ingle E. Turmeric in the management of oral submucous fibrosis - A systematic review and meta-analysis. *Int J Health Sci (Qassim)*. 2020;14(3):41-46.