Original Article

Comparison Of Curcumin Extract And Coconut Oil With Steroids Therapy In Reducing The Symptoms Of Oral Submucous Fibrosis

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Abstract

Background: Limited mouth opening due to fibrosis of oral mucosa is a major symptom of oral submucous fibrosis which a chronic illness. The aim of the management of this chronic illness is to improve mouth opening and relieve unpleasant symptoms so that the quality of life of sufferer can be improved. Studies have validated the role of curcumin in management of the symptoms of the disease due to its antioxidant, anti-inflammatory, and anti-fibrotic potential. Additionally, coconut oil application also have been found in improving the symptoms hence, the study was aimed to compare the efficacy of mixture of curcumin extract and coconut oil with conventional therapy in management of OSF.

Methodology: This experimental study was conducted at tertiary care hospital of Karachi from October 2022 to March 2023. Diagnosed cases (N=30) of oral submucous fibrosis were recruited from the dental OPD and they were divided in to two groups, n= 15 group 1, received the coconut oil with curcumin extract and n=15, group 2 received the corticosteroids (0.1% beclomethasone lotion). Patients were counseled regarding the application of therapeutic agents on the fibrous bands in the oral cavity buccal mucosa and physiotherapy exercises of mouth were recommended. They were instructed to apply the therapeutic agents 2 times a day and follow-up was performed on every month.

Results: The mean difference in pain/ burning sensation and interincisal opening was observed significant (p=<0.05) before and after the intervention in both the groups. Coconut oil with curcumin extract reduced the pain / burning sensation and increased the interincisal opening effectively as that of steroids (0.1% beclomethasone lotion).

Conclusion: Application of coconut oil with curcumin extract facilitates the sufferers in managing pain/burning sensation and mouth opening effectively as that of steroids.

Keywords: Curcumin extract and Coconut oil, efficacy, Steroids, Oral submucous fibrosis,

Introduction:

Oral submucous fibrosis (OSF) is a chronic precancerous lesion that damages the buccal mucosa and soft tissues of the oral cavity by causing tissue fibrosis and scarring (1). The symptoms of OSF includes chronic inflammation, excessive collagen deposition, localized inflammation in the lamina propria or deep connective tissues, and

degenerative alterations in the muscles. Trismus, dysphagia, changed tone, discomfort, taste issues, restricted tongue motion, dry mouth, and mostly pain and burning sensation are clinical signs of the lesion that result in a low quality of life. (2, 3). To enhance patients' quality of life, clinical interventions work to increase mouth opening and decrease uncomfortable symptoms. Nowadays, mouth opening exercises, pharmaceutical therapy, and elective surgery are the three basic kinds of OSF treatment. (4). When used in conjunction with exercise for the management of OSF, several herbal therapies have been investigated and shown effective at reducing symptoms (5).

In spite of the fact that curcumin was first isolated from turmeric in 1815, its chemical composition, manufacturing, and biochemical and antioxidant effects received very little attention until the 1970s (6). Consuming turmeric reduces the incidence of certain diseases in adults, especially those associated with oxidative stress and chronic inflammation, according to epidemiological research. (7). Turmeric, or its active component curcumin, exhibits tremendous promise as a therapeutic agent in the treatment of OSMF due to its antioxidant, anti-inflammatory, anticarcinogenic, chemo preventive, chemotherapeutic, and anti-fibrotic potential. (8). Moreover, coconut oil, which has been utilized for centuries due to its antibacterial, antifungal, and antiviral characteristics, is the most major coconut byproduct. (9). Because of its viscosity, which assists in removing food particles, bacteria, and microorganisms from the mouth coconut oil is used as a mouthwash (10). It has validated its role in physiotherapy of oral cavity in OSF patients as adjuvant (11).

It is documented that long-term corticosteroid therapy may have a negative impact on oral health and cause candidiasis, as well as disrupt bone metabolism and significantly lower mandibular BMD. Patients undergoing long-term corticosteroid therapy may benefit from routine dental examinations and measurements of the mandibular BMD to monitor any changes in their oral health status and determine their risk for osteoporosis (12). Hence, the study was aimed to compare the efficacy of mixture of curcumin extract and coconut oil with steroid therapy in management of OSF to propose a new herbal remedy with equal or greater potential to steroid therapy in reducing the pain/burning sensation and increased mouth opening to provide improved quality of life.

Methodology:

This experimental study was conducted at tertiary care hospital of Karachi from October 2022 to March 2023. The sample was obtained using the consequent sampling procedure, and the total calculated sample size was N=30. Oral submucous fibrosis cases with recent diagnoses met the predetermined inclusion criteria patients with other oral pre-malignant lesions were excluded. The oral submucous fibrosis patients (N=30) were selected from the dental OPD and divided into two groups i.e. 15 patients in each group. Group 1 received coconut oil combined with 1 gm of curcumin extract, while group 2 received 0.1% beclomethasone lotion. Patients were given information on how to apply medications to the fibrous bands in the buccal mucosa of the oral cavity, and oral physiotherapy exercises were recommended. The patients were instructed regarding the frequency of application i.e. apply the medicines 2 times a day and follow-up was performed after 1 month and after 3 months post intervention examinations were performed. The mouth opening (IIMO) and pain/burning sensation were measured using a visual analogue scale (VAS) and a Vernier caliper, before and after the intervention. Statistical analysis was performed on SPSS v20. Student t test was applied to compare both groups and paired t test was applied to identify pre and post intervention differences.

Results:

To complete the sample size 41 individuals fulfilling the inclusion criteria were enrolled in the study. Participants who did not comply the instructions and who couldn't come for follow-up were not included in the analysis. Out of 41, data was analyzed for 32 participants. The mean age of participants was 35 ± 4.1. There were 12 (37.5%) female participants and 20 (62.5%) were males. The mean difference in pain/ burning sensation and interincisal opening was observed significant ($p=<0.05$) before and after the intervention in both the groups. Coconut oil with and without curcumin extract reduced the pain / burning sensation however, despite being insignificant curcumin extract seemed to increase the interincisal opening by 3 mm when compared to coconut oil group.

Table 1. Pain/burning sensation on each visit

No. of visits	Group 1 (Coconut Oil + Curcumin extract)	Group 2 (0.1% beclomethasone lotion)	p-value
	Pain/Burning sensation		
Before the intervention	28.58 ± 7.2	30.2 ± 5.2	0.091
After 1 month	20.65 ± 4.1	23.7 ± 2.6	0.418
After 2 months	15.24 ± 5.61	17.5 ± 3.62	0.087
After 3 months	9.65 ± 3.12	12. 4 ± 4.3	0.079
	Mouth opening (mm)		
Before the intervention	22.81 ± 3.4	22.01 ± 3.5	1.000
After 1 month	25.52 ± 2.6	24.62 ± 2.8	0.531
After 2 months	30.12 ± 4.9	28.91 ± 3.61	0.091
After 3 months	33.61 ± 5.3	32.77 ± 4.12	0.099

Table 2. Effects of intervention before and after the protocol

No. of visits	Group 1 (Coconut Oil + Curcumin extract)	Group 2 (0.1% beclomethasone lotion)
	Pain/Burning sensation	
Before the intervention	28.58 ± 7.2	30.2 ± 5.2
After 3 months	9.65 ± 3.12	12. 4 ± 4.3
P-value	0.001*	0.001*
Mouth opening (mm)		
Before the intervention	22.81 ± 3.4	22.01 ± 3.5
After 3 months	33.61 ± 5.1	32.77 ± 4.12
P-value	0.001*	0.001*

*significant p-value

Discussion:

A chronic premalignant condition called oral submucous fibrosis primarily affects young men who consume cigarettes regularly (13). The primary objective of oral submucous fibrosis (OSMF) management is to reduce the signs and symptoms of the condition because there is no effective cure (14). Along with physiotherapy, applying steroids is mainstay of OSMF management however considering the adverse effects of steroids many natural ointments are also being recommended by the doctors to manage acute symptoms like pain (15). In our study we have compared the effects coconut oil and curcumin extract with steroid therapy on pain and limited mouth opening associated with oral submucosal fibrosis. Both groups' results, which included coconut oil, curcumin extract, and steroids, indicated a significant improvement in the discomfort related to oral submucosal fibrosis in both groups. Various herbal formulations have been reported to be effective for treating oral submucosal fibrosis in numerous investigations. Although they cannot treat the disease, these herbal extracts may help with symptoms like pain, burning, a sensitivity to spicy food, difficulties speaking or swallowing, and a restriction in mouth opening. (16). Aloe vera has been linked to a number of therapeutic activities in the literature, including analgesic, antioxidant, anti-inflammatory, antineoplastic, immunomodulatory, and wound regeneration effects (17). Olive oil has been shown to be effective in treating halitosis, oral ulcers, and dry mouth (18). The coconut, or Cocos nucifera L., has been shown to have antibacterial, antifungal, and antiviral properties (19). Additionally, anti-inflammatory, analgesic, anticancer, carminative, antiseptic, and antibacterial activities of Curcuma longa L. or curcumin have been reported (19).

When used as a mouthwash, coconut oil helps to maintain the oral mucosa wet and moist for a longer period of time, which reduces the dryness, discomfort, and burning feeling brought on by oral submucous fibrosis (20). In patients with oral submucous fibrosis, coconut oil's abundance in fatty acids like lauric acid and monolaurin may have possible anti-inflammatory and antibacterial benefits that reduce the incidence of secondary infections (21, 22).

In our study, the curcumin extract significantly improved mouth opening in individuals with oral submucous fibrosis and also reduced related symptoms including pain and burning. Another trial with comparable findings showed a significant clinical improvement in mouth opening and subjective symptoms, such as burning or pain near the lesion and tongue protrusion, in the group that received curcumin lozenges (23). These actions of curcumin indicate its function in the treatment of oral premalignant diseases like OSMF and demonstrate its potency as a chemo preventive drug.

A systemic evaluation of six clinical trials indicated that curcumin was successful in treating oral submucous fibrosis in all of the investigations. According to the systemic review's findings, curcumin extract is a safe and efficient therapy option for those who have oral submucous fibrosis, particularly for easing the pain and burning that are often associated with the condition. Curcumin might be thought of as a feasible alternative therapeutic option for the treatment of oral submucous fibrosis in addition to its powerful analgesic, anti-inflammatory, antioxidant, and anticancer properties. (24). Curcumin gel and aloe vera gel have both been shown to be successful in treating the symptoms of oral submucous fibrosis in another randomised clinical trial, however aloe vera gel is more efficient in reducing burning sensation without causing any negative side effects (25). When compared to placebo, a second randomised controlled clinical research found that curcumin and lycopene significantly improved mouth opening, burning sensation, tongue protrusion, and cheek flexibility (26). An earlier study's findings, which also indicated improvement in mouth opening, burning sensation, and oral mucosa colour, were similar (27). Curcumin has shown to significantly enhance mucosal flexibility, mouth opening, and tongue protrusion when combined with lycopene and piperine in a different study. This makes curcumin a strong candidate for the treatment of oral submucous fibrosis (28). In a different trial, curcumin coupled with lycopene and piperine dramatically increased mucosal flexibility, mouth opening, and tongue protrusion. The therapy of oral submucous fibrosis is thus a strong candidate for curcumin (29, 30).

Our findings are consistent with the majority of earlier research on the use of curcumin extract as a treatment for oral submucous fibrosis. In order to control oral submucous fibrosis, additional long-term studies should be conducted for validation, and these herbal medications should be combined to established treatment techniques including physiotherapy and chewing exercises.

Conclusion: A common premalignant disease among smokers is oral submucous fibrosis. Except for exercise and physiotherapy combined with conventional treatments, there is no acute treatment available that can significantly enhance patients' quality of life. According to the results of the current study, using coconut oil with curcumin extract helps patients manage their discomfort and burning sensations and mouth opening effectively as that of steroids. Further, to validate the results and promote the created items, we advise long-term studies on a larger sample.

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