

Evaluation of the Efficacy of Turmeric in the Management of Oral Submucous Fibrosis

Research Article

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Abstract

Background: Oral submucous fibrosis is a potentially malignant condition and its treatment poses a great challenge. One new treatment modality which has gained recognition is the use of turmeric.

Objectives: The aim of this study was to evaluate the efficacy of turmeric in the patients of oral submucous fibrosis.

Materials and Methods: Sample sizes of 60 subjects diagnosed with oral submucous fibrosis were included in this study. The patients were administered commercially available turmeric. The mouth opening and burning sensation of patients on VAS scale were evaluated at regular intervals. The data was compared using SPSS 26.0 version.

Results: It was found out that there was significant improvement in the burning sensation on VAS but the improvement in mouth opening was not significant.

Conclusion: From the study, it was concluded that turmeric can be used for the treatment of oral submucous fibrosis and to improve the burning sensation.

Keywords: Oral Submucous Fibrosis; Burning Sensation; Turmeric; Visual Analog Scale.

Introduction

Oral submucous fibrosis (OSMF) is a chronic insidious disease which can affect any part of the oral cavity sometimes pharynx which is although occasionally preceded by or it is associated with formation of vesicles. It is always associated with a juxta epithelial inflammatory reaction which is followed by fibroelastic changes of lamina propria with epithelial trophism which leads to stiffness of oral mucosa causing trismus and inability to eat [1].

The epithelium is atrophic and shows firstly an intercellular edema which is later followed by epithelial atypia that is associated with moderate epithelial hyperplasia. After this stage, the carcinoma can start to develop at any time. Various studies have reported that those patients who are suffering from OSMF are at higher risk of developing oral cancer. Its malignant transformation rate

has been reported to be about 7.6% [2].

There has been said to be multiple factors responsible for occurrence of OSMF. However, there is no single pathophysiology which has been agreed on. That is why, there is no effective treatment and the management of OSMF is still a great challenge [3]. Recently, a new treatment modality has gained recognition which is the use of turmeric in the treatment of OSMF. There have been few studies conducted to assess the potential role of turmeric and its active component, curcumin, which acts as a chemo-preventive agent. The chemo-preventive action of curcumin comes from its anti-inflammatory and antioxidant properties. *In-vitro* studies have been carried out to show the anti-inflammatory and antioxidant activities of curcumin which inhibit lipo-oxygenase and cyclooxygenase (COX) activities which are responsible for inducing inflammation [4].

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Various studies have shown that curcumin lowers the activity of smokeless tobacco extract (STE) or nicotine derived nitrosamine ketone (NNK)- induced nuclear factor kappa-light-chain-enhancer of activated B cells (NF-kB) and COX-2 in the cells of oral premalignant lesions and cancer [5]. The turmeric works by raising the number of micronuclei in the circulating lymphocytes and it acts as a very good scavenger of free radicals [3].

Since very few studies have been conducted on the efficacy of the use of turmeric in the treatment of OSMF, hence this study was carried out to analyze the role of turmeric in the treatment of patients having OSMF.

Materials and Methods

This study was conducted in the Department of Oral medicine. Sixty patients were selected for the study who had been clinically diagnosed with OSMF. The patients were selected in the age range of 21-30 years. Informed consent was taken from the patients for the study. Ethical approval was obtained from the institutional ethical committee.

Detailed history was taken and complete hemogram was done for every patient to rule out any other pathophysiology. Inclusion criteria were; Patients clinically diagnosed with OSMF. Exclusion criteria were; Patients showing malignant changes and Patient not willing to get treatment done.

The patient's mouth opening was measured with the help of a digital vernier caliper. On the visual analog scale (VAS), the burning sensation was recorded. The patients were divided into four groups which were on the basis of interincisal distance according to Lai's [6] i.e. Group I: Interincisal distance > 35 mm, Group II: Interincisal distance between 30 mm - 35 mm, Group III: Interincisal distance between 20 mm - 30 mm, Group IV: Interincisal distance < 20 mm.

Each patient was given Turmix tablet which is a commercially available turmeric product. It contains 300 mg of curcumin and 5 mg of piperine. The tablet was given thrice daily for one month. The patients were called thrice each month and at each visit, the patient's mouth opening and burning sensation were noted.

The data was tabulated and analyzed statistically using IBM SPSS

Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp using Student's t-test at significance of 0.05.

Results

The mean age of the patients in the study group was 35.1 ± 11.4 years. The male:female ratio was 2.5:1. According to Lai's classification [6], these subjects were divided into four groups. with 15 samples in each group (Group I-IV). After one month, Group I showed an improvement of 5 % in mouth opening with an improvement of 84% in burning sensation on VAS. Group II showed an improvement of 4.2 % in mouth opening and 85 % in burning sensation. Group III showed 2 % improvement in mouth opening and 70% in burning sensation. Group IV showed a 7 % improvement in mouth opening and 80 % in burning sensation.

Graph 1 shows the comparison of improvement in mouth opening among the four groups. Graph 2 shows the comparison of burning sensation (VAS) among the four groups. From the results, it was concluded that Group IV showed the maximum improvement in mouth opening and Group III showed the least improvement. Group II showed maximum improvement in burning sensation while Group III showed the least improvement.

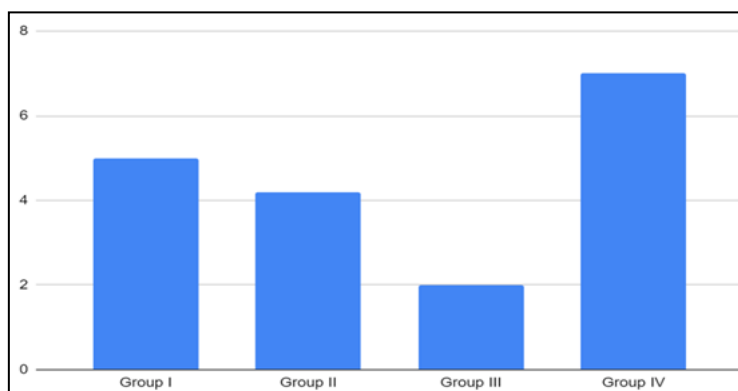
Graph 3 shows comparison of improvement in mouth opening and burning sensation (VAS) in all the four groups. On comparing the data, the improvement in burning sensation on VAS was found to be statistically significant ($p < 0.001$) while improvement in mouth opening was not statistically significant.

Discussion

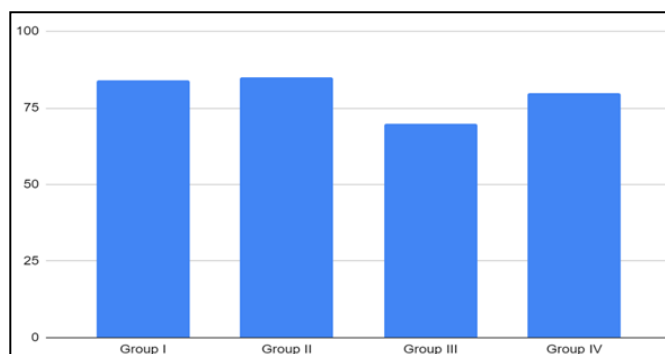
Schwartz, in 1952 found an oral fibrosing disease in five Indian women from Kenya and named it as atrophica idiopathica mucosa oris [2]. In 1953, this condition was named as submucous fibrosis (OSMF). It is defined as an insidious, chronic disease affecting any part of the oral cavity and sometimes the pharynx which is occasionally preceded by and/or associated with formation of vesicle and is always associated with a juxtaepithelial inflammatory reaction which is followed by progressive hyalinization of the lamina propria [6, 7].

Cox and Aziz in 1997 stated that in OSMF, the increasing inability to open the mouth in a patient is the most common complaint which occurs as a result of accumulation of fibrous tissue in the

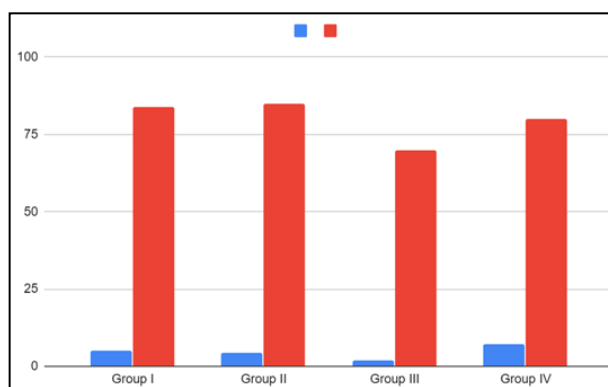
Graph 1. Graph showing the comparison of improvement in mouth opening among the four groups.



Graph 2. Graph showing the comparison of improvement in burning sensation (VAS) among the four groups.



Graph 3. Graph showing the comparison of improvement in mouth opening and burning sensation (VAS) among the four groups.



juxtaepithelial region of the oral mucosa. Paymaster in 1956 was the first person to describe that OSMF has precancerous nature when he had noticed a slow-growing squamous cell carcinoma (SCC) in the patients who had been diagnosed with OSMF [2].

However, the etiology as well as the pathogenesis of the disease is still not well known due to which it is believed that there can be many causative factors of OSMF. In 1968, Pindborg and in 1986, Caniff et al., has described the disease as a reaction to capsaicin, which is present as an irritant in chilies but it has not been completely proved yet. In spite of various number of factors responsible for causation of OSMF, an effective treatment is yet to be devised for it.

Recently, treating OSMF with turmeric is gaining recognition as a treatment modality. The principal curcuminoid which is the curcumin comprises about 2-5% portion of turmeric.

When the patients were treated with turmeric, an improvement in mouth opening as well as burning sensation was noticed in all the groups (Graph 3). The maximum amount of improvement was seen in Group IV patients. It could be due to fibrinolytic and anti-inflammatory actions of curcumin and also the severity of fibrosis and inflammation was maximum in Group IV. Curcumin is said to exert anti-inflammatory activity by inhibiting different molecules which participate in the inflammation process [8].

The fibrinolytic property of curcumin is also due to its ability to inhibit lipid peroxidation and putting cellular proliferation in check. This leads to reduction in the rate of collagen synthesis [9]. We observed improvement in burning sensation on VAS. Maximum improvement was noted in Group II patients because they had the majority of erosions present when clinically examined.

On assessing the overall mouth opening was not statistically significant ($p = 1.5$); while the improvement in mouth opening was statistically significantly similar to studies carried out by Agrawal et al in 2014 [2]. Das et al., observed improvement pattern in mouth opening as well as burning sensation similar to our findings [10]. Saran et al., on evaluation observed that Lycopene had better results than curcumin in improving mouth opening; however, both the drugs were equally effective in decreasing burning sensation in OSMF patients [11]. Rai et al., found that curcumin is effective on OSMF if administered both systemic and topical forms together [12].

Further long term studies are required to evaluate efficacy of turmeric with other herbal content to improve burning sensation and OSMF.

Conclusion

From our study, it was concluded that in the OSMF patients, turmeric has a therapeutic effect. The role of turmeric in oral cancers can be very promising. However, more studies are required to determine its efficacy.

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