Original Article

A Comparison of the Efficacy of Lycopene and Intralesional Steroids in the Management of Oral Submucous Fibrosis

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ABSTRACT

Objective: The purpose of this study was to evaluate and compare the efficacy of oral lycopene with intralesional steroid injection and in combination.

Study Design: Randomized controlled trial study

Place and Duration of Study: This study was conducted at the Department of Oral and Maxillofacial Surgery (Surgical Unit 2), NID, Multan from May 2021 to February 2022.

Materials and Methods: Total 45 patients of OSF participated; three groups each containing 15 subjects were formed. Oral lycopene on daily basis was given to subjects in Group I, biweekly intralesional triamcinolone (40 mg/ml) was administered in participants of Group II and Group III received combination (biweekly steroid injection and daily lycopene) for a period of three months. Any increase in mouth opening and decrease in burning sensation of oral mucosa was noted monthly.

Results: Most of the participants in our study 60% were young male adults and 40% were females participated in our study also comes under the category of young adults. Therefore, the mean age of the subjects in this study was 27.9±3.1 years. There was significant increase in mouth opening in all groups with $p \leq 0.04$. Group III showed relatively increased mouth opening followed by group II and III. We noticed almost complete relief of burning sensation in subjects of all three groups, rapid decline in the burning sensation was observed in group I.

Conclusion: Combination of oral lycopene with steroid injection is more effective in minimizing the symptoms of OSF

Key Words: Trismus, Lycopene, Triamcinolone, Areca nut, Mouth opening, burning sensation

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INTRODUCTION

Oral submucous fibrosis is a chronic, incapacitating disease which is progressive in nature with a considerable increased risk of cancer[1]. This condition affects people of all age groups and both genders, more common in population of subcontinent and its migrants. Countries like Pakistan, India, Bangladesh and Iran are main victims and the reason of it is that habits like chewing areca nut, betel quid and tobacco are common among population of these countries. Above all of that what makes the situation worst is easy availability of these things in these countries. The dilemma is that mostly young adults are suffering from this premalignant condition.

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Schwartz (1952) was the first to account the cases and coined the term "atrophic idiopathica mucosa oris" to describe an oral fibrosing disease occurring in five Indian women from East Africa[2,3]. Latter Joshi termed the condition as oral submucous fibrosis[3].

Etiology of OSF is ambiguous, different risk factors like chewing areca nut, betel quid, and tobacco, intake of spicy food, nutritional deficiencies, genetics and collagen disorders have been recommended to be contributory[4]. This condition is characterized by stiffness of oral mucosa which differs in intensity. Fibroelastic transformation of juxta-epithelial layer occurs, chiefly Type I collagen with variable amounts of other types of collagen constitute fibrosis[5]. It occurs when the balance between synthesis and degradation of collagen is disrupted, which leads to an increase in the total amount of collagen over a period of time[6]. Initial outcomes of this disruption in collagen metabolism are restricted opening of mouth and burning sensation. Risk of developing oral cancer is its grave complication. Broadly two treatment modalities, conservative and surgical methods exist for treatment of OSF; yet significant component of the treatment is to quit the causative habits.

The medical treatment includes injection of steroids, hyaluronidase, placental extract, interferon-γ, collagenase, trypsin, moreover oral pentoxifylline, zinc

and lycopene. Among all of the above lycopene is more commonly used which is a natural pigment in plants and have the ability to reverse the pathogenesis of OSF[7]. Carotenoid drops the prevalence of premalignant lesions and cancer of oral cavity.[8]

MATERIALS AND METHODS

This study was conducted from May 2021 to February 2022 at department of Oral and Maxillofacial Surgery (Surgical Unit 2), NID, Multan. This study was commenced after clearance was obtained from the Institutional ethical committee. Forty five participants of either gender were randomly divided into three groups, each group had 15 subjects.

All the participants were informed about the study and consent was taken. Detailed medical history including the symptoms and history of associated habits such as chewing of areca nut, gutka, betel quid, smoking, pan-masala and alcohol drinking was recorded. Patients who had severe systemic diseases, active oral infections and allergies were excluded.

The premalignant potential of OSF was explained to all the participants and they were counseled and encouraged to quit the habit of chewing areca nut and all its form. They were also motivated to improve their oral hygiene.

Diagnosis was done according to clinical criteria like trouble in eating spicy food, restricted opening mouth, blanched oral mucosa and presence of fibrous bands on palpation. Buccal mucosa was common site.

The chosen participants included all age groups, both males and females and of all socioeconomic status. In our study youngest participant was 16-year-old boy and oldest was 65-year-old man. The number of males and females in our study were 27 and 18. The mean age in group I, II and III were 26.3, 29.8 and 27.5 respectively. Subjects in group I had to take 10mg of oral lycopene every day. On the other hand subjects in group II received intralesional triamcinolone (40 mg/ml) once in 2 weeks (Fig.1). The participants in Group III received intralesional triamcinolone biweekly and lycopene daily for a time period of three months.

In this study two parameters were analyzed, first parameter was to assess the improvement in mouth opening in millimeter (mm) and the second one was sensation of burning in oral mucosa which was recorded by visual analog scale (VAS).

The interincisal mouth opening was recorded using a standard steel scale. The distance between the upper and lower central incisal edges at maximal unaided mouth opening was measured (Fig.2). These two parameters were recorded before starting the treatment and then monthly for consecutive 3 months. Data was entered and examined using SPSS 22.0. ANOVA and Tukey's test for group comparisons were used.

RESULTS

In our study there were total forty five participants, age ranging from 16 years to 65 years. Most of the participants in our study 60% were young male adults and 40% were females participated in our study also comes under the category of young adults. Therefore, the mean age of the subjects in this study was 27.9±3.1 years. The gender distribution in each group is shown in Fig.5. Restricted mouth opening was the most common symptom among all the subjects which is followed by burning and sensation in the oral mucosa. In some patients other symptoms like pain, difficulty in swallowing, difficulty in speech and restricted tongue movements were also seen. In Groups I average baseline mouth opening was 18.13 mm, in group II, 18.07 mm and in group III it was 17.53 mm. The inter-incisor distance at the end of the study was 25.74 mm, 22.06 mm and 26.84 mm in Groups I, II and III with mean increase in mouth opening of 7.67 mm, 3.93 mm and 9.31 mm respectively as shown in Table 1.

At the end of the study there was mean decrease in burning sensation of 9.4, 8.5 and 9.6 in groups I, II and III accordingly, as shown in Table 2. No side effects to the treatment were found.

Figure No.1: Infiltration of Intralesional Steroid

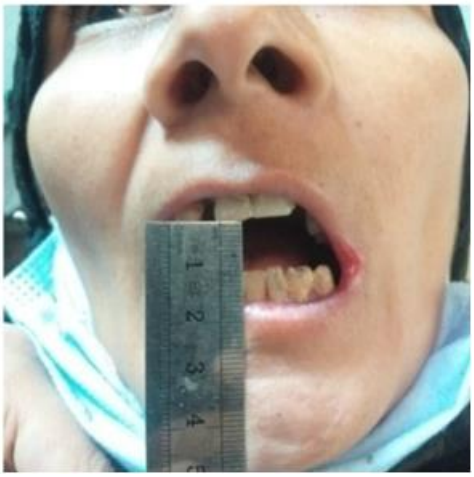

Figure No.2: Measuring Interincisal Distance

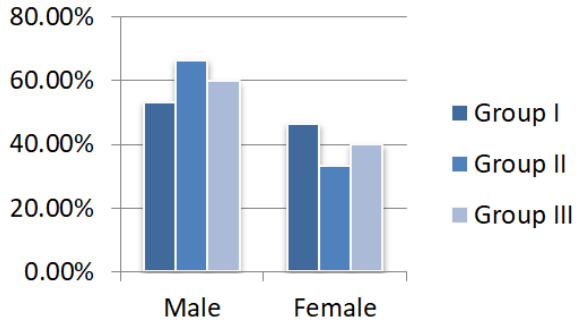

Figure No.3: Gender Distribution in Different Groups

Table No.1: Mouth Opening before and After Treatment (Mm)

Group	Baseline	After 1 month	After 2 months	After 3 months
I	18.13	19.50	20.44	22.06
II	18.07	20.40	23.30	25.74
III	17.53	20.56	23.52	26.84

Table No.2: Burning Sensation before and After the Treatment

Group	Baseline	After 1 month	After 2 months	After 3 months
I	10	3.5	2.1	0.6
II	10	6.3	4.4	1.5
III	10	4.6	2.1	0.4

DISCUSSION

OSF was defined by Schwartz as 'a chronic disease affecting any part of the oral cavity and sometimes the pharynx, associated with inflammatory reaction of juxta-epithelial followed by a fibro-elastic change of the lamina propria which leads to rigidity of oral mucosa and results in trismus. Oral submucous fibrosis (OSF) is a potentially precancerous condition, its prevalence is rising because of increasing habits like chewing areca nut, betel quid and tobacco. Various modes of treatment are present for managing OSF among which more common in practice are intralesional steroids and lycopene. There are various risk factors, but most important factor chewing areca nut in different forms such as pan masala, betel quid, gutka etc. There is substantial evidence present which indicates an important role of areca nut in the etiology of OSF[9,10,11]. Active ingredients in areca nut arecoline, arecaidine and tannin have capability to modulate metabolism of collagen. They stimulate fibroblast proliferation and disrupt normal collagen synthesis, leads to an increased fibrosis pointing towards a dose dependent relation between areca nut and causation of the disease[11,12]. Intralesional steroids hinder fibroblast proliferation of fibroblasts and syntheses of collagen[13]. Triamcinolone acetonide was chosen for the study as it has longer duration of action and less side effects[14]. Lycopene is a red carotenoid which is natural pigment widely found in red or pink fruits and vegetables, such as tomatoes, water melon etc and it is a potent quencher of singlet oxygen[15]. It has anti-oxidant and anti-carcinogenic properties[16]. It has also demonstrated benefits in cancers of the prostrate, pancreas and oesophagus[17].

In our study, there was a significant difference in improvement of mouth opening between the Group I and II ($p \leq 0.04$). In our study there was a significant increase in inter-incisal distance with the use of intralesional triamcinolone this is supported by the study conducted by Ameer et al[18]. But maximum decline in symptoms of OSF was noticed in group III which is similar to the study of Samuel HT[19]. Rapid reduction in the burning sensation was more in group I that could be supported by the study of Kumar et al[20].

CONCLUSION

There was rapid relief in the symptoms of OSF with combination therapy. Hence, it is more efficacious to use intralesional triamcinolone along with lycopene.

Author's Contribution:

Concept & Design of Study:	Zehra Azher Jawa
Drafting:	Tauseef Zahra, Laila Azher Jawa
Data Analysis:	Asif Nazir Ch, Laila Azher Jawa
Revisiting Critically:	Zehra Azher Jawa, Tauseef Zahra
Final Approval of version:	Zehra Azher Jawa

Conflict of Interest: The study has no conflict of interest to declare by any author.

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