Oral submucous fibrosis – an impediment for maintenance of good oral hygiene: A questionnaire-based study

Nikita N. Burde¹, Prabhdeep Kour²

¹Department of Oral Medicine and Maxillofacial Radiology, Maratha Mandal's NGH Institute of Dental Sciences and Research Centre, Belagavi, Karnataka, India, ²Department of Periodontics, Maratha Mandal's NGH Institute of Dental Sciences and Research Centre, Belagavi, Karnataka, India

Abstract

Introduction: Oral submucous fibrosis (OSMF) is characterized by stiffness of the oral mucosa with progressive limitation in opening of the mouth, thus causing difficulty in eating, phonation, and loss of hearing. These changes have a significant impact on the oral hygiene status. Several studies have been conducted to ameliorate the symptoms and improve the overall quality of life. However, not many studies have been performed taking into account the changes in the oral hygiene practices. Through this study, we intend to determine the oral hygiene practices and explore difficulties in oral hygiene maintenance among OSMF patients.

Materials and Methods: Thirty OSMF patients were included in the study. Demographic data and habit history were recorded. Oral hygiene instructions were modified, providing each participant with a toothbrush (360 superflex designed for patients who have difficulty reaching some sites in the mouth). Participants were recalled for follow-up after 15 days. Their feedbacks regarding the efficacy of the toothbrush were taken. Results were subjected to statistical analysis.

Results and Conclusion: Percentage of participants experiencing soft-tissue trauma reduced from 90% to 10%. Accessibility to posterior molar teeth improved from 16.7% to 73.3% of participants at the end of the study. Oral health is a reflection of one's physiological, social, and psychological well-being. Hence, our aim should be to achieve better and cleaner mouths by utilizing readily available resources and providing patients with efficient and easy take home oral hygiene instructions.

Introduction

Oral submucous fibrosis (OSMF) is a potentially malignant disorder that is more common in the Indian subcontinent, but recently, it shows a worldwide distribution.¹ It is a chronic, insidious, disabling disease involving oral mucosa, the oropharynx, and rarely, the larynx.² Although occasionally preceded by or associated with vesicle formation, it is always associated with juxtaepithelial inflammatory reaction. The epithelial atrophy along with fibroelastic change in lamina propria leads to stiffness of the oral mucosa and deeper tissues, loss of tissue mobility, marked rigidity causing trismus, and progressive limitation in protrusion of the tongue. In the later stages, it causes difficulty in mastication and swallowing due to esophageal fibrosis leading to nutritional deficiencies. Involvement of the larynx and eustachian tube leads to hoarseness of the voice and loss of hearing.³⁴ The fibrosis of the buccal mucosa, lips, tongue, and floor of the mouth due to collagen buildup also poses an immense problem in maintaining oral hygiene. Many treatment protocols although palliative rather than curative have been proposed to alleviate the severity of the symptoms of this disease and to improve the overall nutritional status of the individual thus improving one’s quality of life.²⁶ However, not many studies have been performed taking into account the changes in the oral hygiene practices among OSMF patients.

Hence, we conducted a survey with an aim to understand the oral hygiene practices among OSMF patients. After the survey, we advised these patients to use a flexible toothbrush so as to improve their oral hygiene. The comparison of ease of brushing before and after the use of flexi-brush was also evaluated.
**Materials and Methods**

The participants were selected from the Outpatient Department of Oral Medicine and Radiology at Maratha Mandal’s NGH Institute of Dental Sciences and Research Centre, Belagavi, and were enrolled in the survey. The ethical clearance from the Institutional Review Board was obtained before commencement of the survey. They were explained the need for the survey, and an informed consent was obtained from them.

A total of 30 participants, clinically diagnosed with OSMF, were included in the survey. The staging was carried out by following the More et al. classification. The participants were within the age range of 20–70 years without any major underlying systemic diseases (cardiovascular diseases such as hypertension and myocardial infarction and endocrine disorders such as diabetes mellitus). Participants having trismus due to causes other than OSMF, collagen disorders like scleroderma, central nervous system dysfunction affecting motor function and co-ordination, and completely edentulous patients were excluded from the survey.

The demographic data and personal habit history related to frequency and duration of chewing/smoking or both were recorded in a detailed questionnaire. The degree of dependence on smoking and smokeless form of tobacco was evaluated using the modified Fagerstrom tolerance scale. This was followed by listing the changes observed and difficulties faced while toothbrushing after the onset of symptoms of OSMF, especially pertaining to accessibility to posterior areas, e.g., facial and distal surfaces of the molars and repeated soft-tissue trauma while toothbrushing.

At the end of the survey, the oral hygiene instructions were given; each participant was provided with a flexible neck toothbrush (colgate 360-superflex). Participants were recalled for a subsequent follow-up after 15 days, and their feedbacks regarding the efficacy of the new toothbrush were taken.

**Statistical analysis**

The data obtained was subjected to statistical analysis, and McNemar’s test was applied to obtain the results.

**Results and Discussion**

OSMF is a chronic, insidious, crippling, debilitating disease whose progression eventually affects one’s quality of life. It involves the oral mucosa, oropharynx, and rarely, the larynx. The strongest risk factor for OSMF is the chewing of betel quid containing areca nut. The amount of areca nut in betel quid and the frequency and duration of chewing betel quid are clearly related to the development of OSMF. The direct contact of the quid mixture with oral mucosa results in continuous irritation of the oral tissues by various components in the quid including biologically active alkaloids (arecoline, arecaidine, arecolidine, guvacoline, guvacine, flavonoids (tannins and catechins) and copper. Other factors, such as genetic and immunologic predisposition, probably also play a role as OSMF has been reported in families (both children and adults) whose members are not in the habit of chewing betel quid or areca nut. OSMF leads to stiffness of the oral mucosa and deeper tissues with progressive limitation in opening of the mouth. Patients with OSMF have a poor oral hygiene status to begin with, which is further compromised owing to the inability to maintain it effectively due to reduced accessibility to all the areas of the oral cavity and repeated soft-tissue trauma. Since the discovery of this disease, several avenues have been explored to ameliorate the severity of the signs and symptoms with an aim to improve one’s nutritional, physical, and mental well-being. However, not much literature exists on the oral hygiene practices, maintenance, and status in these patients. The toothbrush is an aid chosen according to one’s comfort and convenience; thus the current study was undertaken to target the difficulties faced in oral hygiene maintenance among OSMF patients by educating them and assessing the changes in the same after providing them with a flexible toothbrush.

Twenty-six (86.6%) out of 30 participants included in the study were males which is in accordance to the World Health Organisation (WHO) report published by Rajendran et al in the year 1994. However, Rajendran reported a higher female preponderance among Indian population owing to the pre-conditioning of the oral mucosa by a prolonged, chronic deficiency of iron, and/or Vitamin B complex which is more commonly seen among Indian females than males and the action of the irritant substances acting locally on the oral mucosa. Besides, these values can also be attributed to the small sample size of the current study.

All the 30 participants were dependent on smokeless form of tobacco while 8 (26.7%) out of 30 were dependent on both smokeless and smoking form. Three female participants out of 4 and 17 males out of 26 had significant dependence on smokeless form. 10% of the participants had first-degree relatives who were dependent on smoking as well as smokeless form of tobacco. This shows that tobacco use by the elders in the family plays a role in influencing an individual toward dependency. Five out of 30 participants also consumed alcohol. The Fagerstrom dependence score for chewing form of tobacco was found to be significant with a score of 20 while a low-to-moderate dependence was seen among all smokers with a maximum score of 4.

Restricted mouth opening and burning sensation was reported in 29 out of 30 participants [Table 2]. Out of 30 participants included in the study, 1 participant used tobacco as an aid to maintain oral hygiene. Sixteen participants (53.3 %) used hard toothbrush while only 1 participant used an ultrasonic toothbrush. Twenty-nine participants (96.6%) complained of difficulties while toothbrushing such as reduced accessibility, repeated soft-tissue trauma due to reduced accessibility, and burning sensation after the onset of OSMF, and 25 participants (83.3%) reported reduction in frequency and duration of toothbrushing since the initiation of the above-mentioned difficulties [Table 3].

Twenty-seven participants (90%) experienced soft-tissue trauma due to their toothbrush at the commencement of the
Table 1: Fagerstrom questionnaire scores

| Dependence on habits                  | Number of patients |
|--------------------------------------|--------------------|
| Dependence on smokeless tobacco      | 30                 |
| Mild to moderate                      | 10                 |
| Severe                               | 20                 |
| Dependence on smoking form           | 8                  |
| Tobacco usage in first-degree relatives | 12               |
| Alcohol consumption in the past year | 5                  |
| Fagerstrom dependence score for chewing form | Significant dependence-20 |
| Fagerstrom dependence score for smoking form | Low-to-moderate dependence in all smokers with maximum score of 4 |

Table 2: Clinical signs and symptoms among oral submucous fibrosis participants

| Symptoms and clinical features                                | Number of participants |
|---------------------------------------------------------------|------------------------|
| Restricted mouth opening and its progression; loss of cheek flexibility | 29 (96%)              |
| Burning sensation                                             | 29 (96%)              |
| Dry mouth and difficulty in eating                           | 20 (66.7%)            |
| Difficulty in swallowing and need to sip water to deglut      | 15 (50%)              |
| Alteration in taste sensation                                 | 11 (36%)              |
| Alteration in hearing and voice changes                       | 3 (1%)                |
| Weight loss                                                   | 21 (70%)              |
| Overall quality of life affected (food intake, speech)        | 26 (86%)              |

Table 3: AIDS used in oral hygiene maintenance and difficulties faced

| AIDS used in maintenance of oral hygiene                  | Number of participants |
|-----------------------------------------------------------|------------------------|
| Tobacco                                                   | 1                      |
| Types of toothbrushes used                                |                        |
| Hard                                                      | 16                     |
| Medium                                                    | 10                     |
| Soft                                                      | 2                      |
| Ultra soft                                                | 1                      |
| Difficulty in toothbrushing                               | 29                     |
| Decrease in duration and frequency of toothbrushing       | 25                     |

Table: Acquired immune deficiency syndrome

Graph 1: Bar diagram showing changes in soft-tissue trauma and accessibility before and after introduction of the flexible toothbrush

study, while the remainder 3 out of 30 did not report of any such complaint at all. This number reduced to 10% after the replacement of the toothbrush. Only 5 participants (16.7%) could access the posterior molar teeth region of the mouth while toothbrushing. This figure improved to 22 (73.3%) at the end of the study. However, 3 participants with Stage 4 OSMF and mouth opening of <15 mm still continued to experience soft-tissue trauma and reduced accessibility even after replacement of the toothbrush [Graph 1].

The toothbrush incorporated in the study had considerable flexibility of the neck and is specifically designed for patients who have difficulty reaching some sites in the oral cavity. Significant changes were observed after the replacement of the toothbrush. Due to lack of awareness; participants included in the study were unaware of the availability of this toothbrush.

Patient dexterity, motivation, and compliance work together in establishing an effective preventative regimen for participants with reduced access and soft-tissue trauma from toothbrushing. The use of a small-headed manual brush could enable effective cleaning in the 3 participants who did not show any improvement even after the replacement of the toothbrush that was incorporated in the study.

Conclusion

Oral health is a reflection of the physiological, social, and psychological factors that are essential to our quality of life. The need of the hour is to concentrate on the medical management and the oral hygiene practices and status of the OSMF patients equally to improve their quality of life as a whole.

Hence, our aim should be to achieve better and cleaner mouths by utilizing readily available resources at affordable prices and providing patients with efficient and easy take home oral hygiene instructions.

References

1. Thakur N, Keluskar V, Bagewadi A, Shetti A. Effectiveness of micronutrients and physiotherapy in the management of oral submucous fibrosis. Int J Contemp Dent 2011;2:101-5.
2. Chole RH, Patil R. Drug treatment of oral sub mucous fibrosis – A review. Int J Contemp Med Res 2016;3:996-8.
3. Naphade M, Bhagat B, Adwani D, Mandwe R. Maintenance of increased mouth opening in oral submucous fibrosis patient treated with nasolabial flap technique. Case Rep Dent 2014;2014:842578.
4. Rajendran R. Oral submucous fibrosis: Etiology, pathogenesis, and future research. Bull World Health Organ 1994;72:985-96.
5. Auluck A, Rosin MP, Zhang L, Sumanth KN. Oral submucous fibrosis, a clinically benign but potentially malignant disease: Report of 3 cases and review of the literature. J Can Dent Assoc 2008;74:735-40.
6. Bhave A, Arora G. Oral sub mucous fibrosis: The treatment strategies. Res Rev 2015;3:1-6.
7. More CB, Gupta S, Joshi J, Verma SN. Classification system for oral submucous fibrosis. J Indian Acad Oral Med Radiol 2012;24:24-9.
8. Pindborg JJ, Sirsat SM. Oral submucous fibrosis. Oral Surg Oral Med Oral Pathol 1966;22:764-79.
9. Garnett MJ, Nohl FS, Barclay SC. Management of patients with reduced oral aperture and mandibular hypomobility (trismus) and implications for operative dentistry. Br Dent J 2008;204:125-31.

How to cite this article: Burde NN, Kour P. Oral submucous fibrosis – an impediment for maintenance of good oral hygiene: A questionnaire-based study. J Adv Clin Res Insights 2019;6: 106-109.