Oral Submucous Fibrosis - A hospital Based Study

Ajay Bhambal[1], Swati Balsaraf[2]

[1]Department of Public Health Dentistry, Peoples College of Dental Sciences, Bhopal, Madhya Pradesh, India.

[2]Department of Public Health Dentistry, College of Dental Sciences, Rau, Indore, Madhya Pradesh, India.

Abstract

Background: Oral submucous fibrosis is a potentially malignant disorder of the oral oral cavity and pharynx, characterized by vesicle formation and presence of fibrous bands. **Material and Methods:** The oral submucous fibrosis cases were obtained from Department of Oral Medicine and Radiology of Dental Colleges. The data was collected by simple random sampling. **Results:** Out of 100 OSMF patients, 30 were in stage I, 57 were in stage II and 13 were in stage III. Majority of patients in all stages of OSMF had habit for 5-9 years and frequency for < 5 per day. However no significant correlation was found between duration and frequency of habit and clinical grading ($p > 0.05$). Buccal mucosa was found the most commonly involved site in 90% patients followed by palate in 53% and the retromolar area in 48%. **Conclusion:** The chewing of betel nut and tobacco are the major risk factors of OSMF especially affecting the younger generation. OSMF is more common in males than in females. Buccal mucosa is the commonly affected site. However no significant correlation was found between duration and frequency of habit and clinical grading.

Keywords: Oral submucous fibrosis, betel nut, tobacco, habits, blanching, trismus.

Introduction

The World Health Organization in 1972 classified oral precancerous/potentially malignant disorders into 2 general groups, as precancerous lesion and precancerous condition.[1] Oral submucous fibrosis (OSF) is a precancerous condition of the oral mucosa. It is defined as an insidious chronic disease affecting any part of the oral cavity and sometimes the pharynx, occasionally associated with vesicle formation, and always associated with a juxta-epithelial inflammatory reaction followed by a fibro-elastic change of the lamina propria with epithelial atrophy leading to stiffness of the oral mucosa and causing trismus and inability to eat.[2] The most commonly

involved site is buccal mucosa, followed by palate, retromolar region, faucial pillars and pharynx.[3]. In the modern literature it was first described by Schwartz in 1952 in five female patients in East Africa. He called it '*idiopathic tropica mucosae oris'*. Other terminologies of the disease are *'Atrophia idiopathica,' 'Idiopathic palatal fibrosis', 'Idiopathic scleroderma of mouth'*.[4] Joshi (1953) is the first person who described it and gave it the present term.[5]

Although oral sub mucous fibrosis is a high-risk premalignant state, the independent and interactive associations between cigarette smoking, alcohol consumption and areca nut chewing have not been well established in this oral disease. Oral cancer is extremely frequent in India; all possibilities of finding oral precancerous conditions should be explored. Hence there was a need to check the severity of oral submucous fibrosis in Bhopal. The aim of our hospital based study was to estimate the severity of OSF amongst the patients attending OPDs of dental colleges and to correlate between the duration and frequency of habit and clinical grading of OSF.

Material and Methods

Subject selection:

The oral submucous fibrosis cases were obtained from dental colleges which are accessible to patients from all socioeconomic groups. Ethical clearance was obtained from the institutional ethical committee. Subjects who visited the hospital's Oral Medicine and Radiology department during 2011 and 2012 and were having oral sub mucous fibrosis on clinical examination were considered in this study.

Method of collection of data:

The data was collected by simple random sampling. Detailed information of each patient was collected using a proforma. Emphasis was given to addictions like areca nut, tobacco and alcohol. Subjects who had chewed one betel quid or more or had smoked one cigarette or more per day for at least 1 year were defined as ever chewers or ever smokers. Subjects who had drunk a bottle of alcoholic beverages (including beer, liquor and wine) or more per month for at least 1 year were defined as ever drinkers. Among them, current users were those who had practiced these habits within the past 1 year, and ex-users were those who had stopped the habits for at least 1 year before diagnoses or interviews. For all of the ever chewers and ever smokers, a detailed history of their chewing and smoking habits was recorded, including daily consumption and duration of practice. For ever drinkers, information of the frequency of alcohol intake was collected. Recording the data for oral

submucous fibrosis was based on publications of the World Health Organization and comparable authorized publications. Clinical examination of each patient was done thoroughly, to assess the site, size and type of lesion. 100 patients were selected for the study who were having habit of eating and smoking tobacco, betel nut chewing and alcohol.

Oral Submucous fibrosis was diagnosed solely on clinical grounds and staged into 3 stages.

Clinical staging of OSMF

Stage 1

- Mild blanching
- Inter incisal mouth opening > 30 mm
- Burning sensation on taking spicy food

Stage 2

- Moderate to severe blanching
- Inter incisal mouth opening 20 - 30 mm
- Burning sensation even in absence of stimuli
- Palpable fibrous bands

Stage 3

- Burning sensation is very severe
- Inter incisal mouth opening < 20 mm
- Thick palpable fibrous bands

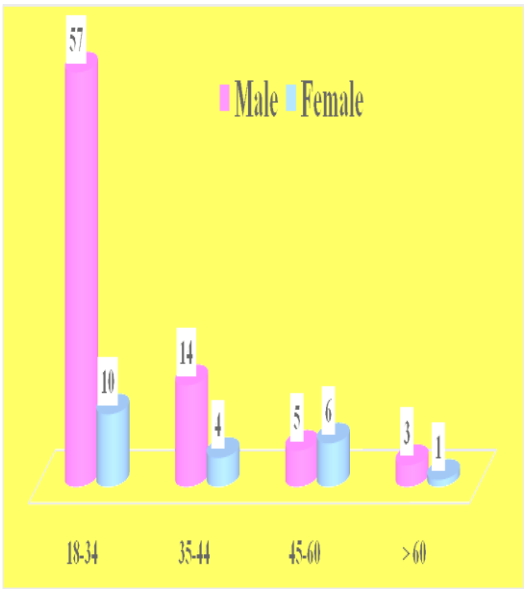
Data was statistically analyzed using SPSS Package Version 17.0 and Chi square test was applied.

Results

Out of 100 OSF patients 79 were males and 21 females with male to female ratio of 3.7:1. Maximum, 67 were in the 18-34 years age group, 18 were in the 35-44 years age group, 11 were in the 45-60 years age group and 4 were in the > 60 years age group (Graph 1).

81% patients were addicted to chewing of betel nut and/or tobacco and/or betel quid. Only 8% patients were addicted to chewing and alcohol, and 11% were addicted to chewing and smoking (Table 1).

Graph 1: Age and sex distribution of OSMF patients



Graph 2: Frequency of habits in OSMF patients

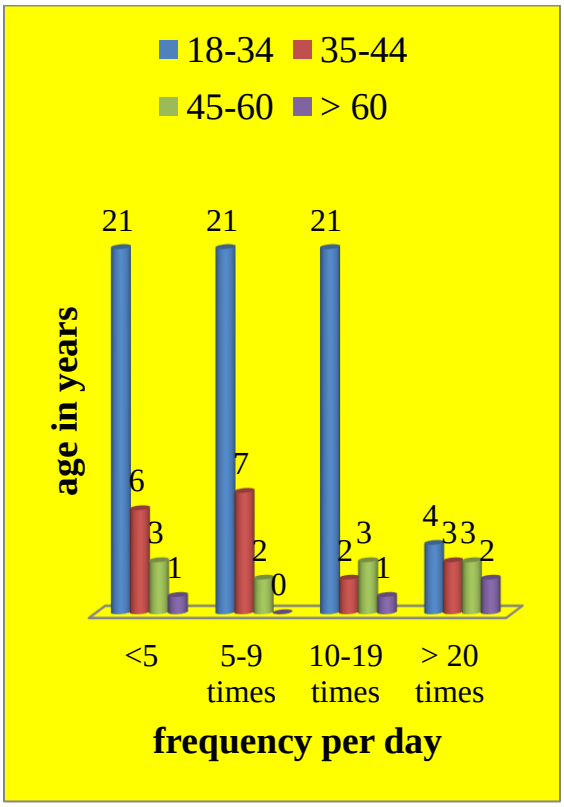


Table 1: Distribution of patients on their personal habits

Personal Habits		Number of Patients	Total
Chewing	Betel nut	15	
	Tobacco + Slaked lime	11	
	Betel nut + Tobacco	50	
	Betel leaf + Betel nut + Tobacco	5	**81**
Smoking	Bidi / Cigarette	0	**0**
Alcohol		0	**0**
Combinati-ons	Chewing + Smoking	11	
	Alcohol + Chewing	8	
	Alcohol + Smoking	0	**19**
	Total	**100**	100

It was found that in the age group of 18-34 maximum patients had the chewing habit of less than 5 times, 5-9 times, 10-19 times and more than 20 times per day followed by the age group of 35-44 years (Graph 2). Out of 100 OSMF patients, 30

were in stage I, 57 were in stage II and 13 were in stage III.

Table 2: Distribution of patients according to duration of habits & clinical staging

Frequency per day	STAGE 1	STAGE 2	STAGE 3
< 5	13	21	5
5 - 9	6	14	2
10 - 19	8	17	4
> 20	3	5	2

Table 3: Distribution of patients according to frequency of habits & clinical staging

Duration (in years)	STAGE 1	STAGE 2	STAGE 3
< 5	7	12	4
5 - 9	11	26	5
10 - 19	8	14	2
> 20	4	5	2
Total	**30**	**57**	**13**

However no significant correlation was found between duration and frequency of habit and clinical grading ($p > 0.05$). Buccal mucosa was found the most commonly involved site in 90% patients followed by palate in 53% and the retromolar area in 48%.

Discussion

Oral submucous fibrosis is a potentially malignant disease of oral cavity. It is most commonly found in Asian countries and constitutes one of the major oral health problems in countries like India. In this study, out of 100 OSF patients 79 were males and 21 females with a male to female ratio of 3.7:1. Maximum, 67 were in the 18-34 years age group. In a study by Hazarey et al similar results were found in central India, in which majority of OSF patients were in the younger age group (< 30 years) with a male to female ratio of 5:1.[6] Pandya S et al in a study on 239 OSF patients over a 4-year period, found that majority of the patients were in the 21–30 years of age group with a male to female ratio of 6.8:1.[7] Kumar et al found similar results from Chennai.[8] However, Zhang et al from China suggested that the prevalence of betel quid chewing is highest in the Hunan and Hainan provinces (64.5% to 82.7%) with signs of OSF in 0.9% to 4.7% of the population and the 30 to 49 years age group being the most commonly affected.[9] Betel quid is a combination of the areca nut (fruit of the *Areca catechu* palm tree, erroneously termed betel nut) and betel leaf (from the *Piper betel,* a pepper shrub), tobacco, slaked lime (calcium hydroxide), and catechu (extract of the *Acacia catechu* tree).Areca nut, incriminated in the causation of OSF is often wrapped in the

leaf of a tropical creeper, *Piper betle* L commonly known as the betel leaf or paan. The usage of paan is widespread in the Indian subcontinent, mostly in the Hindi speaking heartland of North and Central India. In Bhopal region, consumption of a betel nut, tobacco, betel leaf and gutkha is widespread. The frequency of betel nut chewing habit has been reported to be higher among OSF patients than in the general population.[10] Thus chewing of areca nut may be an important factor in the etiology of OSF. Pandya S et al found 110 (46%) patients with habit of chewing paan masala/dohra.[7] On the other hand, Kumar et al reported from Chennai that 81% of their patient's had the habit of chewing raw areca nut/commercial areca nut/paan masala.[8] Arecoline, an alkaloid found in the areca nut, promotes salivation, stains saliva red, and is a stimulant. In a study by Hazarey et al they reported that areca nut in its pure form was more commonly consumed by women while Khara/Mawa, the common name of gutka (combination of areca nut, paan masala and tobacco) in Nagpur region, was usually consumed by men.[6] In our study all patients had the habit of betel leaf, betel nut, tobacco and alcohol. Lime in betel quid acts to keep the active ingredient in its freebase or alkaline form, enabling it to enter the bloodstream via sublingual absorption Babu et al reported that habitual chewing of pan masala/gutkha is associated with earlier presentation of oral submucous fibrosis than betel quid use.[11] Thomas et al from South India suggested tobacco chewing was the most important risk factor for multiple oral premalignant lesions and may be a major etiological factor for cancers on the oral epithelium in the Indian population.[12]

In this study, 81% patients were addicted to betel quid with areca nut and tobacco. Only 8% patients were addicted to chewing and alcohol, and 11% were addicted to chewing and smoking. However no correlation was found between the severity of OSF and betel nut, tobacco and alcohol consumption ($P > 0.05$). In a study by Pandya S et al, 38 (15.8%) patients were addicted to betel quid with areca nut and tobacco, 14 (5.9%) males were addicted to smoking alone, and only 2 (0.8%) males were habituated to alcohol, but no consistent correlation was found between the OSF and smoking/alcohol consumption.[7] Ho et al showed a significant contribution of alcohol consumption and smoking to the malignant transformation of OSF.[13] Similarly, a study from Canada showed that smoking and alcohol drinking along with areca quid chewing showed a significant association with leukoplakia, OSF and verrucous lesions.[14]

Buccal mucosa was found the most commonly involved site in 90% patients

followed by palate 53% and the retromolar area 48%. Similar results were found by Pandya S et al in which buccal mucosa was the most commonly involved site in 66(20.8%) patients followed by palate 37(17.7%) and the retromolar area 22(14.7%).[7] Bhugari et al from Pakistan also reported that mucosa of the cheek (55.9%) was the most common site followed by the tongue (28.4%).[15] While Reichart and Way reported the tongue was the most common site, in their study.[16]

Clinically, trismus is an important symptom of OSF. In this study, 30% patients had stage I trismus, 57% had stage II and 13% had stage III trismus. In one study trismus was the chief complaint in 90.8% of their patients.[17] Another study reported that 75% males and 80% females with OSF patients had stage II disease and suggested that this could be due to the fact that the majority of the patients reported for treatment only after the onset of restriction in their ability to open their mouths.[8] Pandya S et al reported that maximum patients in their study had stage II trismus,[7] while Hazarey et al reported that maximum patients of OSF had stage III trismus.[6]

In our study on the correlation of addiction habit and clinical findings, maximum patients had clinical grade II OSF and took tobacco products for 5-10 years or more with high frequency (5-9 times per day). In one study maximum patients had histopathological grade III OSF and took tobacco products for 8-10 years or more with high frequency (7-10 times per day) followed by histopathological grade II and I.[7] Kumar et al suggested the patients who used paan masala with a greater frequency/ day developed OSF with a shorter duration of the habit.[8] Maher et al from Pakistan reported that the daily consumption rate appears to be much more significant with respect to risk than the lifelong duration of the habit.[18] Some reports suggested that both the duration and daily frequency of areca nut use increase the risk of cancer, suggesting a dose-response relationship.[19] Similarly, Shah et al reported that the total duration of the chewing habit was not significantly correlated to OSF. They hypothesized that the exposure to the total burden of various harmful substances in a given period, *i.e.*, daily consumption was more significant than the total duration of the habit.[20] Also Kumar et al did not find any correlation between clinical symptoms and degree of fibrosis.[8]

Treatment of OSF is based on severity of disease. If the disease is noted prior to development of trismus, cessation of the betel habit will often resolve the disease. Once trismus has developed the goal of therapy is to maintain oral function and limit progression of disease. Because OSF is a chronic mucosal inflammatory disease

(persistent stomatitis and glossitis), control of the inflammation or the factors influencing the inflammatory process should form the basis of definitive management. Various drugs like steroids, pentoxifylline, hyaluronidase, human placenta extracts, chymotrypsin and collagenase, and multivitamin supplements including lycopene, has been used.[21] Surgical treatment is indicated in patients with severe trismus and/or biopsy results revealing dysplastic or neoplastic changes. Surgical modalities that have been used include simple excision of the fibrous bands, Split-thickness skin grafting, Nasolabial flaps and lingual pedicle flaps.[22] Physical therapy using muscle-stretching exercises for the mouth is helpful in preventing further limitation of mouth opening. Combination of medical and surgical therapy can be useful in most of the cases.

Conclusion

The chewing of betel nut and tobacco are the major risk factors of OSF especially affecting the younger generation. OSF is more common in males than in females. Buccal mucosa is the commonly affected site. However no significant correlation was found between duration and frequency of habit and clinical grading.

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Nil.

Conflicts of Interest

There are no conflicts of interest.

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Corresponding Author:

Dr. Swati Balsaraf

Department of Public Health Dentistry,

College of Dental Sciences, Rau, Indore,

Madhya Pradesh, India.

Email ID: smilecare123@rediffmail.com