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Correlation of clinical grading to various chewing habits factors with oral Submucous fibrosis: A cross sectional study

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Abstract

Background: Oral submucous fibrosis (OSMF) is a chronic, progressive, scaring high risk precancerous condition of the oral mucosa seen primarily in the Indian subcontinent and in South East Asia. The exact etiology of OSMF is not well understood. Various factors are being studied such as genetic, autoimmune, nutritional and environmental agents, yet there is a big lacunae in the present scenario of evidence based dentistry which correlates the role of critical components of a habit such as duration, frequency, chewing time to the clinical grading of OSMF.

Aims: To correlate the etiological factors to the severity of clinical grading along duration, frequency and style of chewing habit.

Materials and Methods: A cross sectional study of 400 oral submucous fibrosis (OSMF) patients who attended the dental college Bareilly, over a period of 3 years was done.

Results: Among cases, grade I OSMF was seen in (199), grade II OSMF in (112) and grade III OSMF in (89) subjects, with a male to female ratio of 2.3:1. Gutkha, Pan masala and other arecanut products was practiced most commonly and showed significant risk with the severity of OSMF.

Conclusion: The relative risk of OSMF increased with duration, frequency and style of chewing habits for longer duration and swallowing it without spitting.

Keywords: oral submucous fibrosis, arecanut, gutkha, spitting

1. Introduction

Oral sub mucous fibrosis (OSMF) is a chronic, progressive, scaring high risk pre-cancerous condition involving the oral mucosa, seen primarily on the Indian subcontinent and in south East Asia. The condition is characterized by excessive production of collagen leading to inelasticity of the oral mucosa, reduction in vasculature and atrophic changes of the oral epithelium [1, 2].

Worldwide, estimates of OSMF shows a confinement to Indians and Southeast Asians, with overall prevalence rate in India to be about 0.2% to 0.5 % and prevalence by gender varying from 0.2-2.3% in males and 1.2-4.57% in females [3].Areca nut/betel nut is possibly the second most consumed carcinogen after tobacco in the Indian subcontinent. In India, there are regional variations in the type of areca nut products used. Areca nut is chewed for variety of reasons such as stress reliever, mouth freshener, concentration improver and a digestive following food [4]. The areca nut contains many alkaloids, arecoline being the most abundant, which have been shown to stimulate collagen synthesis by fibroblasts [1].

Over the past several decades, dental researchers reported different aspects of OSMF. Yet, there is a big lacunae in the present scenario which correlates the role of a habit such as duration, frequency, chewing time to the clinical grading of OSMF. The present cross sectional study is being carried out to correlate these variables of the chewing habit to the clinical grading of OSMF.

2. Materials and Methods

The present study was carried out in the department of Oral Medicine and Radiology, Institute of dental sciences Bareilly, UP. Clinical details were retrieved from the departmental files over a period of two years. After proper evaluation of the records, a total of 400 cases of clinically diagnosed OSMF were considered for the study. Clinical details included name, age, sex and different chewing habits like, chewing panmasala with or without tobacco, gutkha chewing, areca nut chewing, plain tobacco, smoking, alcohol. Also duration of habit in years, frequency of habit per day, style of chewing i.e. spitting, and swallowing.

Clinical criteria for the diagnosis of OSMF were as per the criteria described by Bailoor DN (1993) [5].

Grade 1 (Mild OSMF): Mild blanching, No restriction in mouth opening, Central incisor tip to tip of the same side, Normally in Males 5.03 cm. Females 4.5 cm, No restriction in tongue protrusion, mesio-incial angle of upper central incisor to the tip of the tongue when maximally extended with mouth wide open (Normally Males 6.73cm and Females 6.07cm)

Grade 2 (Moderate OSMF): Moderate to severe blanching, Mouth opening reduced by 33%, tongue protrusion reduced by

33%, burning sensation even. Palpable Fibrous bands felt, Lymphadenopathy either unilateral or bilateral.

Grade 3 (Severe OSMF): Burning sensation very severe, more than 66% reduction in the mouth opening, and tongue protrusion, in many the tongue may appear fixed, Ulcerative lesions may appear in cheek, thick palpable fibrous bands felt, lymphadenopathy is bilaterally evident.

The data was collected, tabulated and subjected to statistical analysis.

3. Results

In the present study 400 OSMF subjects were screened, out of which (280) were males and 120 were females, and out of which grade I OSMF was seen in (199), grade II OSMF in (112), and grade III OSMF in (89) subjects. The gender, the age group distribution for OSMF grading showed a non-significant variation, whereas the style of chewing, duration, frequency and time of chewing of the habit showed a significant variation of the clinical grading (Table 1).

Table 1

Gender	Grade 1 OSMF	Grade 2 OSMF	Grade 3 OSMF	P value P =. 586 Not Significant
Male	135	77	68	
Female	64	35	21	

Table 2

Age Group	Grade 1 OSMF	Grade 2 OSMF	Grade 3 OSMF	P value P=. 544 Not Significant
20-30	38	21	9	
31 - 40	106	62	42	
41-50	49	26	27	
>50	10	5	5	
Total	203	114	83	

The gender, the age group distribution for OSMF grading showed a non-significant variation, whereas the style of chewing, duration, frequency and time of chewing of the habit showed a significant variation of the clinical grading (Table 1, 2).

The etiological factors of panmasala and smoking showed non-significance for gradation of OSMF, whereas arecanut, tobacco, and gutkha chewing showed significance. (Table -3)

Table 3

Etiological factor	Grade 1 OSMF	Grade 2 OSMF	Grade 3 OSMF	Total (400)	P value
Pan masala	18	10	6	34	0.747Not Significant
Areca nut	43	47	37	127	<0.000Not Significant
Tobacco chewing	57	14	7	78	<0.000Not Significant
Smoking	20	10	11	41	.628 Not significant
Guthka	61	42	49	152	<0.000Not Significant
Mawa	19	2	1	22	0.002Significant

Table 4: Duration Group

Duration	Grade 1 OSMF	Grade 2 OSMF	Grade 3 OSMF
Up to 3 yrs	60	30	20
4– 6 yrs	65	24	22
7- 10 yrs	53	38	20
11-15yrs	16	16	17
>15 yrs	6	4	9

4. Discussion

Oral submucous fibrosis (OSMF") predominantly affects Asiatic people and is characterized by rigidity of the oral mucosa of varying intensity due to fibro- elastic transformation of the juxtaepithelial and deeper connective tissue. It is a chronic progressive disease leading to marked limitation of jaw opening. The clinical and hisiologic descriptors of OSMF ate now well characterized. OSMF is well recognised as a potentially nialign;mt condition of the oral cavity [6]. Various factors such as genetics, autoimmunity, nutritional deficiencies, and environment have been considered in the etiology of OSMF. A number of chewing substrates, amongst which areca nut appears to be the most prominent, have been associated with OSMF [7]. The present study is undertaken to study the role of different variables which play a vital role in the clinical grading of OSMF in Bareilly, India.

Literature survey of gender distribution has shown wide variations in the occurrence of OSMF. Some epidemiological surveys in India have shown a female predominance [8, 9]. In our study out of 400 OSMF study population we observed (280) were males and (116) were females, with a male to female ratio being 2.36:1. The occurrence of OSMF according to age and sex in our study was similar to that of studies done by Borle RM, Borle SR [10].

Male predominance in our study can be due to easy accessibility for males to use areca nut and its products more frequently than females in our society and changing lifestyles of the youngsters. Habitual chewing of gutkha, Pan masala with and without tobacco and other areca nut products plays a major role in etiology of the condition. In our study gutkha and other areca nut product users like mawa, tobacco when compared to plain panmasala users showed a significant occurrence of OSMF in the severity of the condition. The reason attributes to the fact that the commercially available products as above are concentrated, freeze dried and have

higher dry weight concentration of pathology causing irritants in comparison to the traditionally prepared home made products like panmasala [11].

In our study, as the duration of consuming habits increased above 10 years the severity of the disease also increased with maximum number of cases observed in grade I and grade II OSMF. The frequency of habit of consuming for more than 10 times per day resulted in increased severity of OSMF. Subjects, who consumed, less than 10 times per day had grade I and grade II OSMF. Style of chewing influenced the severity of the condition.

As the parameters of our study in the form of duration, frequency, style of chewing for longer time without spitting increased, it had a significant correlation with the outcome of the severity of the disease in the form of clinical grading. This is in accordance to literature which explains that arecanut/betal nut has high alkaloid arecoline and tobacco ingredients like nitrosamine, which are absorbed for more in the patients who keeped it for longer durations interval and swallow it [11].

5. Conclusion

The present study showed that the use of commercially available arecanut (Pan masala, Guthka and tobacco byproducts to have shown a higher severity in terms of clinical grading of OSMF. It was also found that as habit variables in the form of duration, frequency, and chewing for longer duration and swallowing without spitting have increased its significance in correlation to severity of the clinical grading of OSMF.

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