

Oral Submucous Fibrosis in Mixed Indian Population of Goa: An Epidemiological Study.

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Abstract: Oral Submucous Fibrosis (OSMF) is a premalignant condition with potential malignant behavior characterized by juxtaepithelial fibrosis of the oral cavity. The study was conducted to assess the prevalence, etiology, epidemiology and Socioeconomic Status of OSMF among patients visiting the dental college in Goa. Total of 80 subjects were included, 40 subjects with the OSMF, 40 healthy control subjects. All the enrolled subjects were then interviewed using a structured proforma and examined in the dental clinic using clinical examination tools. Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) 20.0 software. It was observed that the Oral Submucous Fibrosis is mostly seen in younger individuals (The youngest case of Oral Submucous Fibrosis was 19 year old and the oldest one was 64 years of age). In patients with Oral Submucous Fibrosis, the buccal mucosa was involved in all 40 subjects and Gutkha was the most commonly used product (35%). It was observed that the Socioeconomic Status of majority of subjects suffering from Oral Submucous Fibrosis disease have a lower Socioeconomic status. It was observed that maximum number of patients in Stage B-III and Stage B-IV showed gutkha chewing habit, therefore, associated with more in increasing the severity of Oral Submucous Fibrosis than others mentioned in present study. A program which describes the ill effects of Tobacco and its related product on oral health should be initiated so as to increase awareness amongst lower socioeconomic section of the society.

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I. Introduction

The World Health Organization (WHO) defines a precancerous oral condition as “a generalized pathological state of the oral mucosa associated with a significantly increased risk of cancer.” This fits well with the characteristics of Oral Submucous Fibrosis described by **Pindborg JJ and Sirsat SM (1966)** [1] as “An insidious chronic disease affecting any part of the oral cavity and sometimes the pharynx. Although occasionally preceded by and/or associated with vesicle formation, it is always associated with a juxta-epithelial inflammatory reaction followed by a fibroelastic change of the lamina propria with epithelial atrophy leading to stiffness of the oral mucosa and causing trismus and inability to eat.” Until recently, it was thought to be localized to the Indian subcontinent, China and other regions of Asia but is now considered to be of global importance due to large numbers of migrant populations also demonstrating the condition. The rate at which oral precancerous and cancerous lesions are spreading like an epidemic is alarming. The prevalence of oral precancerous lesions and conditions are much higher than that of oral cancer and these provide useful clinical markers for oral cancer. The present study was undertaken to investigate the etiology, clinical findings and prevalence of Oral Submucous Fibrosis in Goa as no such study has been reported in this population till date.

II. Material And Methods

This Cross Sectional Observational Study was carried out at the Oral Medicine, and Radiology Department of the Goa Dental College and Hospital, Bambolim, Goa, 403 202, India from 01-06-2012 to 30-12-2013. This study was conducted on 80 patients, in the age group 16-65 years. Patients were grouped as follows: Group I - 40 healthy individuals (20 males and 20 females) with no apparent lesions of the oral mucosa, and without any tobacco or areca-nut related oral habits.

Group II - 40 patients with Oral Submucous Fibrosis (33 males and 7 females)

Patients in Group A included healthy individuals with no oral lesions and no history of tobacco or areca nut chewing or alcohol intake. Patients in Group B were clinically diagnosed to have Oral Submucous Fibrosis by using the criteria as mentioned by Khanna J.N. and Andrade N.N. (1995).[2] All the patients fulfilling the above criteria were informed about the study in their own mother tongue and only those who agreed and gave a written signed voluntary consent were enrolled in the study. All the enrolled subjects were then interviewed and examined in the dental clinic using clinical examination tools and the personal details of the patients like name, age, sex, occupation, income, address, contact number and socioeconomic status were recorded. Similarly, a

detailed history consisting of chief complaint, history of past and present illness, past medical history, if any, was recorded. Emphasis was laid on recording any oral habits of chewing areca nut, paan (betel quid), gutkha and smoking bidi or cigarette, along with the duration, frequency, quantity, manner of habit practiced per day and socioeconomic status. The subjects found satisfying the clinical diagnostic criteria, as per Khanna et al (1995) [2] classification was included in Oral Submucous Fibrosis group. For clinical examination of the patient Ruler, Divider, Sterilized Drape, Disposable gloves & Mouth Mask, Sterilized; Mouth Mirror, Explorer, Tweezers, Kidney trays to hold the dental hand instrument and cotton or gauze pieces/rolls were used. All measurements were tabulated using Microsoft® Office Excel 2007, according to the study groups. The mean values and standard deviations for all the groups were calculated. Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) 20.0 software.

III. Result & Discussion

In this study, out of the 40 patients with Oral Submucous Fibrosis, 33/40 subjects (82.5%) were males and 7 subjects (17.5%) females. This suggested that the males were affected more as compared to females. It can be due to the fact that males have been found using gutkha and other related tobacco products more because of easy availability in all the places where as females being more conscious about their health and esthetic value, probably felt uncomfortable to ask the vendors in getting the gutkha products or it could be that there are more number of females in the population showing presence of this disease, particularly in the interior villages and those areas bordering our neighboring states but not reporting to the institution. However, there is lack of any conclusive data on this aspect. The institutional incidence of OSMF in our study was 0.22% based on number of patients reporting to our institution i.e., 40 patients diagnosed with OSMF out of total 18,000 patients reported in the hospital OPD within one and a half year duration of study.

The results obtained in this study are in accordance to those obtained in following studies. Pindborg JJ, Mehta FS, Gupta PC, Daftary DK (1968) [3] estimated prevalence of Oral Submucous Fibrosis in India to be 0.2–1.2%, with reports of 0.03% (sample size = 1, 01,761) in Maharashtra, 0.2% (sample size = 10,071) in Gujarat, 0.4% (sample size = 10,287) in Kerala, 0.04% (sample size = 10,169) in Andhra Pradesh, and 0.07% (sample size = 20,388) in Bihar. In Ernakulum, South India, the incidence has been reported as 8/100 000 men and 19/100 000 women/year. In a study conducted by Amiya Aggarwal, Siddhartha Chandel, Nishi Singh, Ankita Singhal (2012)[4] on sample of 41 patients (29 males and 12 females) with Oral Submucous Fibrosis in Dehradun, Uttarakhand, and the prevalence was estimated to be 5.4%.

The male predominance was observed in following studies by Shettar SS & Mubeen (2010)[5] (30 Oral Submucous Fibrosis patients - 24 males and 6 females), Ganapathy KS, Gurudath S, Balikai B, Ballal S, Sujatha D (2011)[6] (20 Oral Submucous Fibrosis patients - 16 males and 4 females), Rupak S, Giju George Baby, Sheeba Padiyath, Kiran Kumar KR (2012)[7] (20 Oral Submucous Fibrosis patients- 16 males and 4 females) and Hegde Karthik & Preeti Nair (2012)[8] (30 Oral Submucous Fibrosis patients- 29 males and 1 female).

In the present study, the mean age of patients in the Control group was 40.28 ± 14.28 years, while that of patients with Oral Submucous Fibrosis was 35.92 ± 12.24 years. The significant difference in mean ages can be attributed to the age-related occurrence of these conditions. Oral Submucous Fibrosis is more common in younger individuals (1st-3rd decade of life) suggesting that Oral Submucous Fibrosis is a disease predominantly affecting younger patients.

The results obtained in this study are in accordance with studies conducted by Ganapathy KS, Gurudath S, Balikai B, Ballal S, Sujatha D (2011)[6] (20 patients with mean age of 28.85 ± 8.34 years), Shettar SS & Mubeen (2010)[5] (30 patients with mean age of 29.60 ± 9.60 years) and Apeksha R Balpande, Sathawane RS (2010)[9] (30 patients with mean age of 26.46 ± 8.83 years) Hegde Karthik & Preeti Nair (2012)[8] (30 patients with mean age of 28.85 years) and Rupak S, Giju George Baby, Sheeba Padiyath, Kiran Kumar K. R. (2012)[7] (20 patients with mean age of 28.85 years), Lavina Taneja, Bagewadi Anjana and Keluskar Vaishali (2007)[10] (33 patients with mean age of 30.66 ± 10.28 years). A possible reason for the slightly higher mean age in Oral Submucous Fibrosis group of our study than those compared with could be owing to the fact that we included patients in the age group between 16-65 years of age, while the compared studies had age range mostly in 16-50 years.

The Student's t-test (unpaired) was applied to the data to differentiate between the mean values observed in males and females age in each of the study groups. A statistically significant difference between mean age ($p < 0.05$) of males and females was observed in Group B. There was no statistically significant difference between mean ages ($p > 0.05$) of males and females in Group A. This difference in mean age of males and females in Oral Submucous Fibrosis can be attributed to the unequal number of males and females in this group owing to the fact that Oral Submucous Fibrosis is more commonly seen in males whereas in the control group, equal number of males and females were selected in a specified age range.

In the present study, it was observed that the buccal mucosa was involved in all 40 cases of Group B (Oral Submucous Fibrosis) (Table # 1). The results obtained in this study are in accordance with the study conducted by Ahmad MS, Ali SA, Ali AS, Chaubey KK (2006)[11] on 157 subjects of Oral Submucous Fibrosis and 135 control subjects, they found that the most commonly affected region was buccal mucosa and observed it in 59/157 subjects (39 %) of Oral Submucous Fibrosis. Another study conducted by MasoomehShirzaii, Maryam Hormozy, JavidDehghanHaghighi, Mani Javadimehr (2013)[12] on sample size of 70 subjects (69 males and 1 female) with Oral Submucous Fibrosis also found that the most commonly affected region was the buccal mucosa [44/70 subjects (62.8%)]. The involvement of the buccal mucosa in majority of the cases of Oral Submucous Fibrosis correlates with the habit of placement of the tobacco / betel quid in the buccal mucosa / vestibule areas.

Table 1: Distribution of Subjects According to Site of Lesion in the Study Group B

Group	Site	No. of Cases	Percentage
B (i.e. Oral Submucous Fibrosis)	* Buccal Mucosa	4	10 %
	* Buccal Mucosa + Palate	8	20%
	* Buccal Mucosa + Tongue + Palate	10	25%
	* Buccal Mucosa + Tongue + Palate + Labial Mucosa	18	45%

When grouped according to stage of the lesion, as given by Khanna JN & Andrade NN (1995)[2] in our study, 3/40 subjects (7.50%) in Group B showed Stage I Oral Submucous Fibrosis. Stage II Oral Submucous Fibrosis was seen in 15/40 subjects (37.50 %), 18/40 subjects (45%) had Stage III Oral Submucous Fibrosis, while 4/40 subjects (10%) showed stage IV Oral Submucous Fibrosis.

In the present study, gutkha consumption was found the highest in comparison to other products (Table # 2), the increase in frequency of number of people consuming gutkha could be owing to the fact that during the recent years, with the advent of attractive, conveniently packed sachets and mass and media advertisements, consumption of gutkha by younger people has increased. The other reason might be easy availability of gutkha in every corner. The results obtained in this study are in concordance with the studies conducted by Ahmad MS, Ali SA, Ali AS, Chaubey KK (2006)[11] they found that 87/157 subjects (55.5 %) of Oral Submucous Fibrosis had a habit of chewing gutkha, 25/157 subjects (16%) had habit of chewing paan and by Renuka J Bathi, SameenaParveen, Krishna Burde (2009)[13] with sample size of 220 (212 males and 8 females) patients of Oral Submucous Fibrosis found that maximum patients had habit of chewing gutkha [144/220 subjects (65.5%)], paan without tobacco [23/220 subjects (10.5 %)], paan with tobacco [28/220 subjects (12.7%)] and various combination of habit like gutkha with panmasala and betel quid chewing in [25/220 (11.3%)] subjects. AmiyaAggarwal, Siddhartha Chandel, Nishi Singh, AnkitaSinghal (2012)[4] conducted a study on 41 cases of Oral Submucous Fibrosis (29 males and 12 females) and found that majority of patients i.e. 26/41 subjects (63%) had habit of chewing gutkha and tobacco habit was seen in 6/41 subjects (14%) and remaining 9/41 (23%) subjects were observed consuming various combination of like gutkha, panmasala and betel quid chewing. Kalbande AB, Khakse GM, Priya D, Tamgadge PB (2013)[14] conducted a study on 370 cases of Oral Submucous Fibrosis out of which 270/370 subjects (72.9 %) had a habit of chewing gutkha, 203/370 subjects (54.9 %) had habit of chewing paan and 137/370 subjects (37%) had habit of chewing areca nut.

Table 2: Distribution of Subjects According to Duration, Frequency and Quantity of Deleterious Habit in the Study Group B

Group	Site	No. of Cases	Mean Duration	Mean Frequency	Quantity Per Day
B (i.e. Oral Submucous Fibrosis)	Gutkha	14	4 years	10-12 times	8 pkt/day
	Tobacco	12	9 years	6-7 times	7 pkt/day
	Paan with Tobacco	10	6 years	8-9 times	9 paan/day
	Gutkha & Smoking	3	5 years	4-5 times	3 pkt/day & 1pkt/day
	Paan with Smoking	1	20 years	10 times	10 paan& 1pkt/day

In this study, all the patients of Oral Submucous Fibrosis had a history of chewing habit in the form of gutkha, tobacco, betel quid and various combinations of above mentioned habits along with cigarette smoking (Table # 3). It was also seen that the manner of chewing was more of swallowing the juice rather spitting of the juice (Table # 4) The findings in our study is in accordance to the findings obtained in study by Ahmad MS, Ali SA, Ali AS, Chaubey KK (2006)[11]. They found that the maximum gutkha chewers [54/152 subjects (33.5%)] had a habit of eating 8-10 packets per day and were using since 2-4 years. Majority of the Oral Submucous Fibrosis cases kept gutkha in the buccal vestibule [59/152 subjects (39 %)] or they chewed and swallowed it [61/152 subjects (40 %)], only a small number of patients chewed and spitted it out [32/220 subjects (21%)]. In

a study conducted by Renuka J Bathi, SameenaParveen, Krishna Burde (2009)[13] on the sample size of 220 Oral Submucous Fibrosis (212 males and 8 females) patients found that maximum patients [68/220 subjects (31.1%)] had habit of consuming gutkha for more than 5 years. MasoomehShirzaii, Maryam Hormozy, JavidDehghanHaghighi, Mani Javadimehr (2013)[12] conducted a study on sample size of 70 subjects (69 males and 1 female) found that maximum number of chewers 43/70 subjects (61%) had habit of consuming it more than three times in a day.

Table 3: Distribution of Subjects According to Manner of Deleterious Habit in the Study Group B

Group	Manner	No. Of Cases	Percentage
Group B (Oral Submucous Fibrosis)	• Swallowing the juice	21	52.5 %
	• Spitting the juice	19	47.5 %

Table 4: Distribution of Subjects According to type of Deleterious Habit practiced in the Subgroups of Study Group B

Stages	Gutkha	Tobacco	Paan + Tobacco	Gutkha+ Smoking	Paan +Smoking
Stage B-I(No. of Cases)	-	1(33.33%)	1(33.33%)	1(33.33%)	-
Stage B-II(No. of Cases)	4(26.66%)	5(33.33%)	3(20%)	2(13.33%)	1(6.66%)
Stage B-III(No. of Cases)	8 (44.44%)	5(27.77%)	5(27.77%)	-	-
Stage B-Iva (No. of Cases)	2(50%)	1(25%)	1(25%)	-	-

In this study it was also observed that maximum number of patients in Stage B-III (8/18 subjects) and Stage B-IV (2/4 subjects) showed gutkha chewing habit (Table # 5). Therefore it can be quoted that gutkha chewing is associated more in increasing the severity of Oral Submucous Fibrosis than other habits mentioned in our study.

Table 5: Distribution of Subjects According to Socioeconomic Status in the Study Groups

Group	Total No. of patients	Below PL* (No. Of Cases)	Above PL (No. Of Cases)
Group A (Control)	40	11 (27.5 %)	29 (72.5 %)
Group B (Oral Submucous Fibrosis)	40	21 (52.5 %)	19 (47.5%)

*PL –Poverty Line

In present study, Socioeconomic Status of subjects in the two study groups was assessed and it was based on the Poverty Line Computed as per Tendulkar method (2011- 2012)[15] conducted by the National Sample Survey Office (NSSO) of the Ministry of Statistics and Programme Implementation for the Goa State. Subjects were categorized as below Poverty Line (Rs. <5500/month per capita income) and above Poverty Line (Rs. >5500/month per capita income). It was observed that the Socioeconomic Status of majority of subjects suffering from Oral Submucous Fibrosis disease have a lower Socioeconomic status. The reason for majority of Oral Submucous Fibrosis cases coming from low Socioeconomic Group can be due to poor quality of food, low vitamins and particularly iron deficiency. The findings in our study is in concordance to the findings obtained in studies by Ahmad MS, Ali SA, Ali AS, Chaubey KK (2006)[11] who in their study observed that most of the Oral Submucous Fibrosis patients belonged to middle class [65/157 subjects (41 %)] and [48/157 subjects (30 %)] belonged to low Socioeconomic Group and RajendrasinhRathod, Rashmi GS, RutviChhaya (2010)[16] study on sample size of 50 patients of Oral Submucous Fibrosis and found that the majority of the patients [30/50 subjects (60 %)] belonged to low Socioeconomic Status. The limitation of our study was that being an institution based study and not a house-to-house survey so possibly there could be more number of patients in the population showing presence of this disease, particularly in the interior villages and those areas bordering our neighboring states but not reporting to the institution.

IV. Conclusion

It was observed that the Socioeconomic Status of majority of subjects suffering from Oral Submucous Fibrosis have a lower Socioeconomic status. Therefore measures should be taken to provide free nutrient supplements to people below Poverty Line so that the nutritional balance can be achieved in such patients and severity of disease can be reduced. A program which describes the ill effects of Gutkha and its related product on oral health should be initiated so as to increase awareness amongst lower socioeconomic section of the society.

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