To Study the Prevalence of Areca Nut Induced Oral Submucous Fibrosis in Patients Visiting Dental OPD of Shalinitai Meghe Hospital and Research Center Nagpur: A Demographic Study

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Abstract

Background: Oral submucosal fibrosis (OSMF) is now recognized internationally as an Indian disorder. This has one of the highest percentages of malignant transition between oral lesion and condition potentially malignant, Consequently, it is a source of concern for oral medical practitioners. The goal of the present study is to assess the frequency of OSMF among betel nut chewers in various group of age.

Research Methodology: Collectively 80 OSMF sufferers in dentist OPD of Shalinitai Meghe Hospital and research center, Nagpur over a period of 4 months (1 December 2019 to 21 March 2020) Chosen for the analysis. A comprehensive history of the case and a clinical test was carried out under displayed illumination. OSMF diagnosis was based on mouth opening troubles and blanched oral mucosa, marked with noticeable fibrous bands. Many diagnostic features included sensation of pain, salivation, protrusion of the tongue, behaviors and related malignant changes. The study was conducted based on age group, period of the habit, habit frequency and habit form. Simple correlation analysis was performed.

Results: of OSF's 80 cases searched, 37 (46.25%) cases were in stage II, 27 (33.75%) were stage III, 9 (11.25 %) stage I, and 7 (8.75 %) stage IV. Based upon age group, group III (30--40 years) Had been more prominent than the others. Areca nut (gutkha) was an important etiologic agent (55.8%) as compared with other etiological agent.

Conclusion: The high incidence of OSMF in the general population requires a substantial understanding and treatment of these lesions. Primary health care practitioners and dentists should be informed and familiar with these lesions, including etiology and pathogenesis, clinical appearance, treatment and management.

Keywords: *Areca nut; clinical fibrosis; prevalence. staging; oral submucous.*

Introduction

Shushrutha defined a disorder in ancient medicine, "vidari" below mouth and throat disorder. He observed gradual narrowing of the mouth, oral mucosa discoloration and difficulty in taking the food. Such features align specifically with the oral submucosal fibrosis symptom severity.[1] A case of "atrophica idiopathica tropica mucosae oris" that occurs in Indians in East Africa was first mentioned by Schwartz (1952). That disorder was first mentioned in India by Lal and Joshi (1953). The word "oral submucous fibrosis (OSMF)" discovered by Joshi.[2] Histopathologically, the 4 successive stages of the OSMF were mentioned by Pindborg and Sirsat (1966).[3]

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Seedat and Van Wyk (1988) reported on the permanent existence of the disease, that is, once OSMF was caused by the addiction of chewing betel nut, reversal of the disease could not appear after termination of habit.[4]

The severity of the condition can be pucked by facts published in a 2004 study that India ranks the maximum among all world records for oral cancer rates with 75,000-80,000 cases recorded per year. This disorder had been confined to countries such as India, Pakistan, Bangladesh, etc. for many years, but now this condition is stated to be due to increased levels of immigration.[5-7]

This outbreak is partly due to the lot quicker in the variety of industries engaged in efficient and easy manufacturing and intense promotion of items such as gutkha and pan masala that was launched professionally in India in 1980. Major steps even by Governments to counter this important health problem are lacking mainly because of the apprehension of impacting farmers' living standards and others. Karnataka, an indian state, develops about 65 percent of the overall areca nut consumed in the country, but a restriction was imposed on gutkha only recently after many other states restricted the commodity there under Food Safety and Standards Act.Farmers have to be informed about the adverse affects, and allowed to grow other crop that can bring benefits to them .[8-11]

The World Health Organization says that by 2020, tobacco death in India will reach 1,5 million per year. Oral cancer develops by the development of normal oral mucosa exposed to nicotine into a pre- malignant lesion that gradually transforms to carcinoma. OSMF is now recognised internationally as an indian disease.it has one of the highest levels of malignant transformation among pre- malignant oral disease. [12,13]

Considering its historical nature, medical service physicians may play a very important role in rapid recognition of OSMF. It is a severe oral cavity disease with unknown etiology, with areca nut chewing the most popular. The occurrence of this harmful addiction in India is already on the rising, so this once rare disease has become really widespread, so knowledge of clinical characteristics, diagnosis, and management is the main stay to counter this threat. Thus the position of healthcare provider becomes essential, becoming the first line of interaction with the general population. The current study aimed to assess the incidence of OSMF amongst betel nut chewers among north Indian population in different demographics.

Materials and Method

The present study was conducted in the Dept. of dentistry at Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre in collaboration with Sharad Pawar Dental College, Datta Meghe Institute of Medical Sciences, Wardha, a cross- sectional survey was carried out for 4 months. Approval was obtained from the Institute's ethical committee and written consent was received from the participant. Patients with OSMF had been separated by gender. It screened out a total of 80 patients with OSMF. All oral exams were carried out by expert investigators who knew about oral mucosal defects in the surrounding area. A clean mouth mirror was used for tissue retraction, and the oral cavity test was conducted using exam gloves. The patients selected were divided into four groups, based on their clinical grade:

Grade I: Interincisal mouth which opens up to or above 35 mm, stomatitis and blanching of mucosal surface.

Grade II: Interincisal mouth openings between 25 and 35 mm, with/without stomatitis,

Grade III: Interincisal mouth opening from 15 to 25 mm; development of visible fibrous bands in buccal surface and/or pharynx, and in every other portion of the oral cavity. .

Grade IV: Interincisal mouth with less than 15 mm of width.

A. For eg, some other grades along with other pre-malignant lesion, oral leukoplakia, oral erythroplakia, etc

B. Any additional stage associated with an oral carcinoma.

Based on class of age the OSMF patients were divided into four categories:

- Class I: 10–20 years
- Class II: 20–30 years
- Class III: 30–40 years
- Class IV: 40–50 years.

OSMF incidence was also reported based on the duration of the habit, and divided into three class:

- Class A: 2–5 years
- Class B: 5–10 years
- Class C: More than 10 years.

This research was performed on the basis of the habit type and broken down into three classs:

- Class 1: Guthka, pan masala.
- Class 2: Betal quid.
- Class 3: Tobacco, smoking.

Results

A number of 2,570 subjects were tested up, 80 subjects were discovered to be suffering from the OSMF. Out of 80 subjects, 78 were males (97.33%) and 02 were females (2.33%). Accordion to mouth opening, OSMF was divided in four Stages. Table 1 shows more prevalence in Stage II 37 (46.74%), followed by Stage III 28 (34.66%), Stage I 08 (10.47%), and Stage IV 07 (8.14%). Table 2 displayes the incidence on the basis on age of group, more prevalence of OSMF was found in Group III (34.42%), followed by Group II (30.70%), Group IV (27.91%), Group I (4.65%), and Group V (2.32%). In Group I, more incidence was discovered in Stage II (75%) OSMF than Stage I (25%). In Group II, approximately same incidence was found in Group II (34.90%) and Stage II (34.90%). Minimum incidence was recorded in Stage I (30.70%) under Group II. In Group III, maximum incidence was discovered in Stage II (54.73%) OSMF than Stage III (45.27%) OSMF. No prevalence was found in Stage I and Stage IV. In Class IV, maximum incidence was discovered in Stage II (50%) OSMF followed by than Stage III (29.17%) and Stage IV (20.83%) OSMF. Finally, in Group V, all 02 patients were found in Stage IV. ($P < 0.001$).

Table 1: OSMF incidence according to clinical stage

OSMF stage	Number	Percentage	Mean
Stage I	08	10.47%	20
Stage II	37	46.74%	
Stage III	28	34.66%	
Stage IV	07	8.14%	
Total	**80**		

Table 2: OSMF frequency according to group of age.

Age group (in years)	Total	Percentage	Stage	Number	Percentage	Mean
10-20 years (Group I)	04	4.65%	Stage I	01	25%	01
			Stage II	03	75%	
			Stage III	00	-	
			Stage IV	00	-	
20-30 years (Group II)	25	30.70%	Stage I	08	30.20%	06
			Stage II	08	34.90%	
			Stage III	09	34.90%	
			Stage IV	00	-	
30-40 years (Group III)	27	34.42%	Stage I	00		07
			Stage II	15	54.73%	
			Stage III	12	45.27%	
			Stage IV	00	-	
40-50 years (Group IV)	22	27.91%	Stage I	00	-	06
			Stage II	11	50%	
			Stage III	06	29.17%	
			Stage IV	05	20.83%	

Age group (in years)	Total	Percentage	Stage	Number	Percentage	Mean
50-60 years (Group V)	02	2.32%	Stage I	00	-	01
			Stage II	00	-	
			Stage III	00	-	
			Stage IV	02	100%	
P<0.05	80					

Table 3 Displays the frequency of OSMF according to addiction length. Group A was comprised of people with a 2–5 year addiction. Group B consists of persons with a habits period of 5–10 years, and group C consists of individuals with a habitual period of even more then 10 years. Group C (48.84 percent) showed a high prevalence compared with Group B (47.67 percent) and Group A (3.49 percent). This incidence had been significant Stastical [*P*<0.0001].

Table 3: OSMF incidence depends on the timing of the habit.

Duration of habits	Total	Percentage	Stage	Number	Percentage	Mean
2-5 years (Group A)	03	3.49%	Stage I	30	100%	0.1
			Stage II	00	-	
			Stage III	00		
			Stage IV	00	-	
5-10 years (Group B)	38	47.67%	Stage I	06	14.63%	09
			Stage II	14	38.05%	
			Stage III	16	42.44%	
			Stage IV	02	4.88%	
More than 10 years (Group C)	39	48.84%	Stage I	0	-	10
			Stage II	22	58.57%	
			Stage III	12	29.52%	
			Stage IV	05	11.90%	
P<0.05	80					

Table 4 Displays habit intensity (per day) and was split into 3 groups. Group A had such a habits intensity of 2-5 times/day; group B had such a habits intensity of 5-10 times/day and group C had such a habits intensity of even more over 10 times/day. For group C (45.81 percent) the incidence has increased than even in group B (41.86 percent) and group A (12.33 percent). Significant statistical incidence was (P < 0.001).

Table 4: OSMF incidence according to habit level per day.

Frequency habit/day	Total	Percentage	Stage	Number	Percentage	Mean
2-5 (Group A) Times/day	10	12.33%	Stage I	06	56.60%	02
			Stage II	04	43.40%	
			Stage III	00	-	
			Stage IV	00	-	

Frequency habit/day	Total	Percentage	Stage	Number	Percentage	Mean
5-10 times/day (Group B)	33	41.86%	Stage I	03	8.33%	08
			Stage II	19	58.33%	
			Stage III	10	29.17%	
			Stage IV	01	4.17%	
More than 10 times/day (Group C)	37	45.81%	Stage I	0	-	09
			Stage II	14	37.05%	
			Stage III	18	48.98%	
			Stage IV	05	13.96%	
P<0.05	80					

Discussion

Yang showed the effect, distribution of gender, age, incomes and urban growth status of patients with OSF in Taiwan. During the duration 1 January 1996 to 31 December 2013 people were identified with OSMF. It found that OSMF frequency substantially increased from 8.3 (per 10 (5)) in 1996 to 16.2 (per 10 (5)) in 2013 ($P < 0.0001$). Males had a substantially greater incidence of OSMF than females. [14] Sinor et al . found higher prevalence in OSMF case in India. [15] In the current study, male prevalence could be more common than females allows for easy availability for males to use areca nut and its items. Male patients was higher than females, with an OSMF incidence of 97.67 per cent compared to 2.33 per cent in females.

Mehrotra performed a research in Allahabad, North India, to determine the prevalence levels of oral mucosal lesions at this hospitals from 1990 to 2001. With relation to age, sex, site involving and histological results, data has been collected year wise. This found that pre-malignant and malignant oral lesions in patients visiting the hospital in this area were prevalent[16] Likewise, in a population-based case-control study in various socio-economic Lucknow, patients have used pan masala have been observed to be at an increased risk of getting OSMF. [17]

Babu et al. ‘s findings amongst Hyderabad OSF patients found that people were more susceptible to gutkha than in any other associated areca nut and tobacco products like pan, pan masala, and raw areca nut. They found a clear correlation between gutkha chewing and OSMF, and pointed out that gutkha eating resulted in OSMF [18] Nigam et al. established OSMF incidence and seriousness between common gutkha, areca nut, and Moradabad, India pan eating. OSF incidence was 6.3 per cent and gutkha eating was the most common harmful habit in the study of OSF patients. [19] Likewise, traditional gutkha chew with tobacco was more predominant in this sample than gutkha.

Throughout this study the age demographic of 80 patients was 15–60 years, with a highest prevalence in 30-40 years. (34.42%), followed by 20–30 years (30.70%).Therefore, it can be assumed that the incidence of OSMF is most often seen in age category 30--40 years influenced by 20-30 years. The youngest patient is 16 and the oldest were 60. The finding of the current study were similar to that of Nigam, who recorded the highest limit of OSMF cases in the 36--40 year age category. [19] This may be attributed to increased social interactions and economic freedom in a quickly developing country like India that they are getting at this age. Therefore, they indulge in various chew habits throughout that period, such as betel nut, guthka, pan masala, smoking, alcohol, etc., either to alleviate tension, as a trend, or because of social pressure.

Shah discovered OSMF ‘s relationship to different chewing and smoking behaviors. These are discovered that eating of areca nut/quid or pan masala (a promotional preparation of areca nuts, lime, catech and unconfirmed colouring agents, flavoring agents and sweetening agents) was closely applicable to OSMF and eating intensity has been highly linked with OSMF instead of the duration of the habit. [20] Ali et al. assessed the impact of the intensity, length and form of areca nut products on OSMF occurrence and progression. This found that the length and intensity of its use and the form of isca nut material has had an impact on OSMF occurrence and progression. Gutkha and pan masala have quicker

and more deleterious effects on the intestinal cavity. The gutkha-chewing addiction together with the other habits has no major impact on the occurrence rate and the frequency and intensity of the OSMF . [21] Current study demonstrated significant impact on the incidence and severity of OSMF by the period and duration of the use of areca nut items..

Clinical staging of all 80 OSMF patients has been evaluated in the present report. Stage II was discovered to see highest patients (46.42%) and stage III (34.52%), stage I (10.73%) and stage IV (8.33%). In his study of 1,006 OSMF patients, Kumar discovered that there were 422 (41.94 per cent) cases in stage II. 226 (22.29 percent) were stage IV, stage III 184 (18.29 percent) and stage I 174 (17.29 percent) which varies slightly from the current analysis. [22] This may be on the basis that major changes in particular are not used in the cases resulting, restricted opening of the mouth, and unless there is a considerable adoration of the body of the patient's functions, patients will not response the doctor, and moreover a lack of data about the disease can attach to this as well.

The conversion from premalignant to malignant varies between 3% and 19%. A recent Indian study indicated that 25.77 percent of OSF cases were transformed to oral squamous cell carcinoma (OSCC) indicating the troubling malignancy possibility of OSMF.[23]

Accumulated epidemiological studies across a large geographical area will assist assess the total current prevalence rate and implement suitable measures to prevent. epidemiology data accumulated across a wide geographic area can help determine overall incidence and prevalence levels and formulate appropriate preventive and control measures. Highly risky members of the community of tobacco use will be focused and Community involvement should be made. Policymakers interested need to laid down legislation to counter this ever-growing threat. Primary healthcare practitioners and dentists should play an significant part in preventing and managing lesions caused by tobacco, as they are typically the first line of interaction for patients at elevated risk.

Conclusion

The widespread accessibility and marketing of these areca nut product, especially gutkha and pan masala in social sites, has affected the average person in India, leading to an increased incidence of pre-malignant OSMF. In this study, the incidence of OSMF in gutkha eaters is much more rapid and extreme compared to other types of areca nut eaters. Intensity of habit displayed statistically significant, suggesting that the seriousness of the disease also grew as intensity of habit increases. OSMF's increasing rate requires a considerable assessment and acceptance of such lesions amongst these normal community. Primary health care practitioners, even dentist, must be associated with etiology and pathogenesis, diagnostic criteria, prevention and rehabilitation of these diseases.

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