Prevalence of Oral Submucous Fibrosis in a Tertiary Care Hospital of Odisha - A Cross-Sectional Study

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ABSTRACT

BACKGROUND

Oral Sub Mucous Fibrosis (OSMF) is the most common precancerous lesion prevalent in Asian subcontinent and India. It raises concern among oral healthcare professionals because among all potentially malignant oral lesions and conditions, this precancerous condition has highest rates of malignant transformation. The aim of our study is to evaluate the prevalence of OSMF in habitual areca nut chewers among the patients attending the out-patient Department of Dentistry of Veer Surendra Sai Medical College and Hospital, Burla.

METHODS

This cross-sectional study was conducted in dental out-patient department of Veer Surendra Sai Medical College and Hospital, Burla for a period of 3 years (January 2015 - December 2017). Individuals with a clinical diagnosis of Oral Submucous Fibrosis according to WHO were included in the study, after obtaining an informed consent and approval of Hospital Ethical Committee. A total of 36000 patients were screened, out of which 457 were included in the study. Specialist examiners carried out all oral examinations who were accustomed with oral mucosal lesions found among the local population. A sterile mouth mirror and examination gloves were used for intraoral examination. On the basis of age group, habit duration, and type of habit, the study was carried out. Shapiro-Wilk test was used for assessing data distribution and Chi-square test for comparing the categorical data.

RESULTS

The prevalence of OSMF was found to be more common among males than females, with 99.14 % in males as compared with 0.87 % in females. Majority of the patients were in the age group of 15 - 25 years (213 patients out of 457) which accounted for 46.6 % with most them in Stage II (69.01 %). 49.23 % of patients had habit duration of 3 - 7 years (225 out of 457) with the majority of them in stage II (60.88 %).

CONCLUSIONS

Increased occurrence of OSMF among the general population in India may be attributed to the sale of areca nut products especially gutkha and pan masala in public is precisely being targeted for the younger generation. Primary healthcare professionals and dentists should also help to cessation of these habits among the public by participating in the programs targeted to this cause.

KEYWORDS

OSMF, Prevalence, Inter-Incisal Mouth Opening

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BACKGROUND

Shushrutha mentioned a condition, "vidari" under mouth and throat diseases in ancient medicine characterized by reduction of mouth opening, depigmentation of oral mucosa, and pain while having food. The symptomatology of oral submucous fibrosis fitted well with these features.[1] Schwartz (1952) first reported a case of "atropica idiopathica mucosae oris" occurring in Indians in East Africa. In India, this condition was first described by Lal and Joshi in 1953. Joshi coined the term "oral submucous fibrosis".[2] Histologically, the four consecutive stages of the OSMF was described by Pindborg and Sirsat in 1966. The irreversible nature of the disease was reported in 1988 by Seedat and Van Wyk, that is, the reversal of the disease induced by the habit of chewing betel nut, could not occur even after cessation of the habit.[3]

Oral submucous fibrosis is an oral premalignant condition of the oral cavity characterized by inflammation and submucosal fibrosis affecting the oral cavity, pharynx and upper third of the oesophagus leading to rigidity of mucosa and marked trismus.[4] Throughout the world, the prevalence of OSMF shows a widespread trend in Southeast Asians especially India, with an overall prevalence rate of approximately 0.2 – 0.5 %, and a gender prevalence of 0.2 – 2.3 % in males and 1.2 – 4.57 % in females.[5]

According to World Health Organization prediction, by 2020 tobacco deaths in India may exceed 1.5 million annually. Among all potentially malignant oral lesions OSMF, having the highest rates of malignant transformation is now globally accepted as an Indian disease.[1]

The increased prevalence of this lesion may be attributed to prevalence of deleterious habit of betelnut chewing in India. Therefore, the main halt to curb this menace is by the primary healthcare physician having adequate knowledge about the clinical features, diagnosis, and treatment strategy. The aim of the present study was to evaluate the prevalence of OSMF in habitual areca nut chewers among the patients attending the Out-Patient Department of Dentistry of Veer Surendra Sai Medical College and Hospital, Burla.

METHODS

This cross-sectional study was conducted in Out-Patient Department of Dentistry of Veer Surendra Sai Medical College and Hospital, Burla, for a period of 3 years (January 2015 - December 2017). Individuals with a clinical diagnosis of oral submucous fibrosis according to WHO were included in the study, after obtaining an informed consent and approval of Hospital Ethical Committee. A total of 36000 patients were screened out of which 457 were included in the study. The data was collected through questionnaire mentioning the demographics, habit, clinical features and stage of OSMF.

Specialist examiners familiar with oral mucosal lesions in the local population carried out all oral examinations. Retraction of oral tissues was carried out with a sterile mouth mirror and examination gloves was used during intraoral examination. According to the clinical stages, the selected patients were divided into four groups:

Stage I: Interincisal mouth opening up to or greater than 35 mm, stomatitis, and blanching of oral mucosa.
Stage II: Interincisal mouth opening between 25 and 35 mm, presence of palpable fibrous band in buccal mucosa and / or oropharynx, with / without stomatitis.
Stage III: Interincisal mouth opening between 15 and 25 mm; presence of palpable fibrous bands in buccal mucosa and / or pharynx, and in any other parts of the oral cavity.
Stage IV: Interincisal mouth opening less than 15 mm.
The OSMF patients were divided on the basis of their age groups and duration of their habits.

On the Basis of Age

Group I: 15 – 25 years.
Group II: 25 - 35 years.
Group III: 35 – 45 years.
Group IV: 45 - 55 years.

On the Basis of Duration of Habits

Group A: < 3 years.
Group B: 3 – 7 years.
Group C: 7 - 10 years.
Group D: > 10 years.

On the Basis of the Type of Habit

Group I: Gutkha.
Group II: Betel.
Group III: Gutkha + Smoking.

Exclusion Criteria

1. Individuals with chronic systemic illness like hypertension, diabetes.
2. Individuals diagnosed with scleroderma or with a history of radiotherapy for oral cancer.

Data was analysed using IBM SPSS statistics version 21 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). Shapiro-Wilk test was used for assessing data distribution and chi-square test for comparing the categorical data. The value of $p < 0.05$ was considered statistically significant.

RESULTS

Out of the screened 36000 subjects, 457 subjects were found to be having OSMF. Figure 1 shows that out of those 457 subjects, 453 were males and 4 were females. According to their staging, a total of 213 subjects were in Group I (15 – 25 years) (60 in stage I, 147 in stage II and 6 in stage III); 152 patients were in Group II (25 - 35 years)

(15 in stage I, 80 in stage II, 45 in stage III and 12 in stage IV), 57 patients in Group III (35 - 45 years) (7 in stage I, 6 in stage II, 39 in stage III and 5 in stage IV) and 35 patients in Group IV (45 - 55 years) (5 in stage I, 3 in stage II, 12 in stage III and 15 in stage IV). Table 1 show more prevalence in group I and stage II in particular.

Age Group (in years)	Total	Percentage	Stage and Number		Percentage
15 - 25 Group I	**213**	46.6 %	Stage I	60	28.16 %
			Stage II	147	69.01 %
			Stage III	6	2.81 %
			Stage IV	0	-
25 - 35 Group II	**152**	33.26 %	Stage I	15	9.86 %
			Stage II	80	52.63 %
			Stage III	45	29.60 %
			Stage IV	12	7.89 %
35 - 45 Group III	**57**	12.47 %	Stage I	7	12.28 %
			Stage II	6	10.52 %
			Stage III	39	68.42 %
			Stage IV	5	8.77 %
45 - 55 Group IV	**35**	7.65 %	Stage I	5	14.28 %
			Stage II	3	8.57 %
			Stage III	12	34.28 %
			Stage IV	15	42.85 %
p < 0.05	**Total 457**				

Table 1. Prevalence of OSMF Based on Age Group

Duration of Habit (in years)	Total	%	Stage and Number		%
< 3 years Group A	**91**	19.91 %	Stage I	45	49.45 %
			Stage II	46	50.54 %
			Stage III	0	-
			Stage IV	0	-
3 - 7 years Group B	**225**	49.23 %	Stage I	42	18.66 %
			Stage II	137	60.88 %
			Stage III	38	16.88 %
			Stage IV	8	3.55 %
7 - 10 years Group C	**109**	23.85 %	Stage I	0	-
			Stage II	51	46.78 %
			Stage III	41	37.61 %
			Stage IV	17	15.59 %
> 10 years Group D	**32**	7.002 %	Stage I	0	-
			Stage II	2	6.25 %
			Stage III	25	78.125 %
			Stage IV	5	15.62 %
p < 0.05	**Total 457**				

Table 2. Prevalence of OSMF Based on Duration of Habit

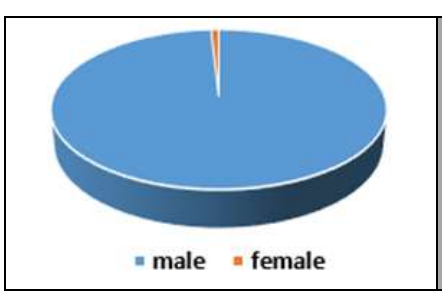

Figure 1. Prevalence of OSMF Based on Age

On the basis of duration of habits, the patients were divided into 4 groups (Table 2). According to the division, in Group A (< 3 years) there were in total of 91 patients among whom 45 patients were in stage I, 46 were in stage II; in Group B (3 - 7 years) the total number of patients were 225 among whom 42 are in stage I, 137 in stage II, 38 in stage III and 8 in stage IV; in Group C (7 - 10 years) 109 patients were identified among whom 51 in stage II, 41 in stage III and 17 in stage IV and in Group D out of 32 patients, 2 were in stage II, 25 in stage III and 5 in stage IV. Table 2 shows more prevalence in group B and stage II in particular.

On the basis of the type of habit, out of the 457 patients, 305 patients had gutkha chewing habit, 57 patients had betel and areca nut chewing habit and 95 patients had gutkha chewing along with smoking habits (Figure 2).

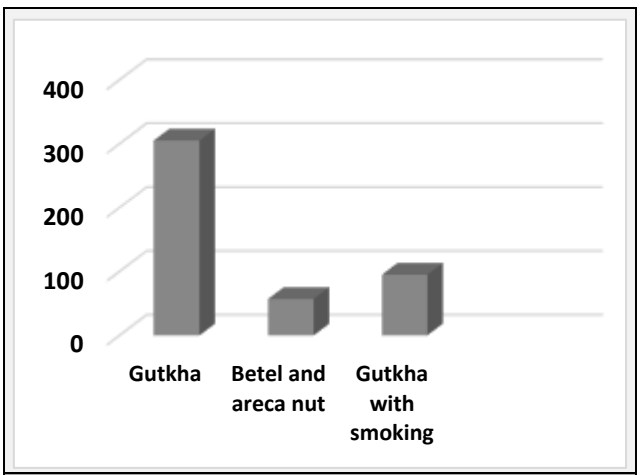

Figure 2. Prevalence of OSMF Based on Habit

DISCUSSION

Oral submucous fibrosis is the most common oral premalignant condition among Indians.[4] Areca nut is considered the main aetiological factor as suggested by various epidemiological and intervention studies. A study was done by Goeletal.[6] which showed that commercial areca nut consumption was 40 % among OSF patients; Ahmad et al.[7] showed that 69 % were consuming gutkha. Other studies have reported an increased prevalence in the consumption of areca nut and areca nut-based products, which are addictive and psychoactive in nature.[5] In this study, 309 patients had gutkha chewing habit and 95 of them had gutkha chewing as well as smoking habit. The active alkaloid found in betel nuts is arecoline, that causes increased production of collagen by 150 % by stimulating fibroblasts. Chewing areca nuts for 5 - 30 minutes significantly increases their high copper content to soluble copper levels in oral fluids, supporting the hypothesis of high copper level as an initiating factor for OSMF.[8]

The prevalence, male to female ratio, socio economic status of OSF patients in Taiwan was assessed by Yang and found that men had a significantly higher OSMF prevalence than women.[9] Sinor et al. in India found male predominance in OSMF cases.[1] In present study, the convenience of males to reach upto areca nut products can be attributed to male predominance than females. The prevalence among males was 99.14 % as compared to 0.87 % in females.

Oral submucous fibrosis exhibits some regional variation in the age distribution. According to two population based studied in India conducted by Bhonsle et al. 1987, the mean age of 27 patients was 37 years which was significantly lower compared to the mean age of 64 patients in Ernakulam which was 52 years. According to a recent survey conducted by Jie Ging Tan et al. in China, oral submucous fibrosis was found in patients predominantly over the age of 30 years.[10] In this study it was noted that majority of the patients were

in the age group of 15 - 25 years (213 patients out of 457) which accounted for 46.6 % with most of them in stage II (69.01 %). In a developing nation like India, these prevalence among younger generations can be attributed to increased social encounters and economic liberty. The addiction among younger generation to various habits of chewing betel nut, guthka, pan masala, smoking, alcohol, etc., is most commonly due to stress relieving, or as a fashion or peer pressure.[1]

In this present study, 49.23 % of patients had habit duration of 3 - 7 years (225 out of 457) with the majority of them in stage II (60.88 %). This data can be attributed to the fact that significant oral symptoms are not prevalent in the early stages and thus explains the ignorance of minor oral changes alarming the patients to approach the doctor.[1] The change of premalignant condition to malignant one varies from 3 % to 19 %. About 25.77 % OSMF cases being transformed to Oral Squamous Cell Carcinoma (OSCC) has been reported by a recent study from India depicting the alarming malignant potential of OSMF.[11] The overall incidence and prevalence rates can be well understood by piling up the epidemiological data from a wide geographical area and this will help to formulate certain preventive measures and awareness for controlling the rate of prevalence of this condition. Steps must be taken at community health levels by concerned policy makers to decrease the rate of prevalence affecting the targeted population of younger generation. Healthcare professionals especially dentists must lead the key role in prevention and control of the precancerous lesions and conduct programs intended to create awareness among the public for cessation of these habits.

CONCLUSIONS

In comparison to any other precancerous lesions, OSMF has the highest malignant potential. The sale of areca nut products especially gutkha and pan masala in public is precisely being targeted for the younger generation leading to more prevalence of OSMF among them. In the present study, OSMF among arecanut chewers is more prevalent. The need of the hour is to create awareness and management of these lesions among the general population. There is an urgent need to create awareness among the public about the adverse effects of such products. However, the Supreme Court, Government of India, and other state governments must put forward specific strategies to ban such commercial products. Primary healthcare professionals and dentists should also help the public in quitting these habits by participating in the programs.

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