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VARIOUS ORAL HABITS ASSOCIATED WITH THE PREVALENCE OF ORAL SUBMUCOUS FIBROSIS IN A WESTERN UTTAR PRADESH POPULATION: A CROSS SECTIONAL DEMOGRAPHIC STUDY

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ABSTRACT

Introduction: Oral submucous fibrosis is a chronic debilitating disease of the oral cavity. A condition similar to OSMF has been described as "vidari" in Susrutha under the name of mouth and throat diseases. It is a chronic progressive disease with many etiological factors. It also carries risk of development of cancer. With this background a study was conducted on patient with OSMF and associated oral habits. **Aims:** Primary objective of the study is to determine the prevalence of oral submucous fibrosis in Western Uttar Pradesh. The secondary objective is to understand the role of various oral habits in the pathogenesis of Oral submucous fibrosis. **Material and Method:** This unicentric cross sectional study was conducted in the tertiary health care on patient with different oral habits. The study was conducted from January 2020 to March 2022 on 578 patients with clinical diagnosis of oral submucous fibrosis with or without any other oral lesion. **Results:** Data obtained was tabulated and subjected to statistical analysis. All the variables like age, gender, socioeconomic status, and site of lesions were analysed using the Chi-square test for proportion. **Conclusion:** Oral sub mucous fibrosis is very common among people belonging to South Asian subcontinent. In India it is more prevalent in Southern part due to common practice of habits like use of areca nut. Awareness related to ill effect of various oral habits need to be increased among the general population.

KEYWORDS: Oral Submucous Fibrosis, Areca nut, Oral cancer, smokeless tobacco.

INTRODUCTION

Oral submucous fibrosis is a chronic irreversible condition of the oral cavity. The condition is caused by habits however mainly seen in patients with history of chronic areca nut chewing with or without tobacco or any other additive. The disease has various presentations depending upon the stage at which the diagnosis was made. It may vary from intolerance to spicy food to progressive decrease in mouth opening that may progress to complete trismus or even development of oral cancer in late stage. The prevalence rate of OSMF varies from 0.2% to 0.5% in India, with a high percentage being found in the Southern part of our country.[1] This chronic disease bring morbidity due to progressive decrease in mouth opening and intolerance to spicy food but also carry risk to transform into malignant lesion.

Use of areca nut is a very age-old habit in India. They are frequently being used as betel quid (areca nut, tobacco, slaked lime and betel leaf) or as guthka (containing mainly areca nut and smokeless tobacco with undisclosed flavouring agent).

With this background a study was conducted among patient visiting to the OPD of our dental college with history of OSMF and to understand the relationship

between severity of oral submucous fibrosis and the oral habit and to discuss the role of various habits in the pathogenesis of oral submucous fibrosis

MATERIAL AND METHOD

It was a unicentric cross sectional study conducted on 578 patients with OSMF visiting to Dental OPD of tertiary health care center with history of various oral habits like use of smoked tobacco, smokeless tobacco, areca nut in various form and combination. The study was conducted from January 2020 to March 2022. The study sample was calculated using the Cochrane formula for sample size determination for an unknown large population. Questionnaire based on various oral habit and its duration and frequency was used as an investigation tool. Informed consent was obtained from the patient. Patient willing to be a part of the study and willing to share the information regarding the habit were included in our study. However patient not giving consent and not willing to share the information regarding the habit were excluded from the study. The diagnosis was based on the clinical presentation of oral submucous fibrosis that include burning sensation, pain, and ulceration, progressive restriction in mouth opening, blanching of the mucosa, depapillation of the tongue, and loss of pigmentation and shortening of the uvula.

Statistical Analysis

All the variables like age, gender, socioeconomic status, and site of lesions were analysed using the Chi-square test for proportion. SPSS software version 22 was used for analysis.

RESULTS

The male to female ratio was 4.5:1. [Table 3] Mean age of occurrence was 36.96 ± 12.27. 38.1% subject belonged to lower income group and 22.2% belonged to lower middle-income group [Table 3]. 82.6% of the subject were involved in the single oral habit [Table 2]. 578 subjects had clinical diagnosis of oral submucous fibrosis [Table 1]. The youngest age of occurrence was 5-year-old male kid.

The most common age of occurrence of oral submucous fibrosis was 31-40 years [Table 4]. It was found to be statistically significant. In addition, most of the cases of oral submucous fibrosis were reported in the study group with duration of habit 11-15 years [Table 4].

Table 1.

Variable		**N**	**%**
Diagnosed Cases	**With Oral Submucous Fibrosis**	**578**	**100**
Gender	Male	478	82.65
	Female	100	17.34
Age Interval	5 - 10 years	1	0
	11 - 20 years	0	0
	21 - 30 years	74	12.75
	31 - 40 years	218	37.75
	41 - 50 years	195	33.67
	51 - 60 years	67	11.73
	61 - 70 years	23	4.08
	71 - 80 years	0	0
SES (Socio economic status)	Upper	3	0.5
	Upper Middle	184	31.9
	Lower Middle	169	22.2
	Upper Lower	220	38.1
	Lower	2	0.3
Duration of Habit	1 - 5 years	32	5.6
	5 - 10 years	121	20.9
	11 - 15 years	180	31.1
	16 - 20 years	83	14.3
	21 - 25 years	71	12.2
	26 - 30 years	56	9.7
	31 - 35 years	27	4.6
	35 - 40 years	8	1.5

Table 2: Habits of study participants.

	N	**(%)**
OSMF patient with habits	578	100
Pattern of habits		
Double	478	82.6
Single	80	13.8
Triple form	20	3.6
N – Number; % - Percentage		

Table 3: Demographic Variables of the selected Sample.

Age (Mean)		**36.96 ± 12.27**	
		N	**(%)**
Age Interval	5 - 10 years	1	0.2
	11 - 20 years	34	5.9
	21 - 30 years	185	32
	31 - 40 years	169	29.2
	41 - 50 years	121	20.9
	51 - 60 years	45	7.7
	61 - 70 years	22	3.8
	71 - 80 years	1	0.3
Gender	Male	474	81.9
	Female	104	18.1
SES	Upper (I)	3	0.5
	Upper Middle (II)	184	31.9
	Lower Middle (III)	169	22.2
	Upper Lower (IV)	220	38.1
	Lower (V)	2	0.3

N – Number; % - Percentage; SES – Socio economic status.

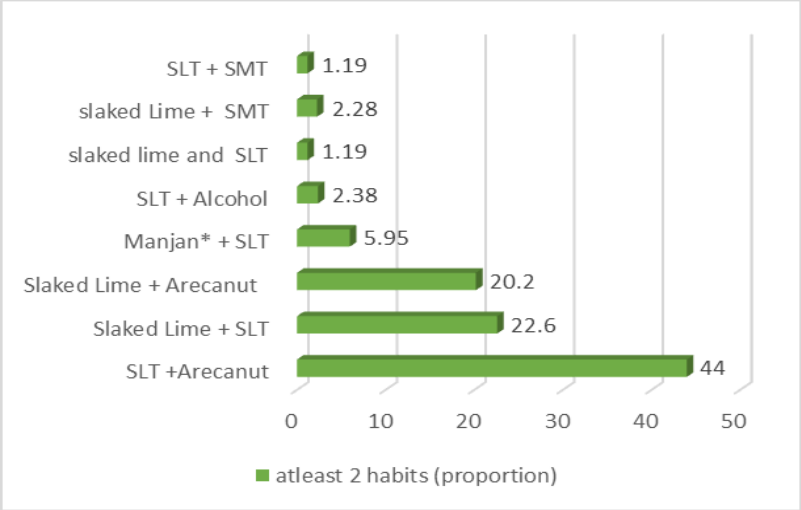
Table 4: Association of Age intervals with duration of habits among patients with Oral Submucous Fibrosis.

Duration\Age	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**71-80**	**Total**
1-5 years	1	0	9	20	3	0	0	5.6% (32)
5 - 10 years	0	4	27	68	17	4	0	20.9% (121)
11 - 15 years	0	9	25	85	44	13	3	31.1% (180)
16 - 20 years	0	2	6	25	42	8	0	14.3% (83)
21 - 25 years	0	0	3	12	38	12	6	12.2% (71)
26 - 30 years	0	0	0	6	32	12	6	9.7% (56)
31 - 35 years	0	0	0	0	6	14	7	4.6% (27)
35 - 40 years	0	0	0	0	3	3	3	1.5% (8)
Total	1	15	70	216	185	66	25	578

Chi Square Value	92.63
P value (2 tailed)	P > 0.0001

The highest number of cases with oral sub mucous fibrosis was observed in the age group of 31 – 40 years.

In addition highest cases with oral sub mucous fibrosis had the habit of consuming tobacco and other products for 11 – 15 years which was statistically significant. (P > 0.0001)



Graph 1.

SLT – Smokeless Tobacco; SMT – Smoking Tobacco; *Manjan – Dentifrice

DISCUSSION

Estimates of OSMF prevalence in India range from 0.2–2.3% in males to 1.2–4.6% in females, ranging from 11 to 60 years of age.[2] There has been a marked increase in incidence following the widespread marketing of commercial tobacco and areca nut products, commonly referred to as Gutkha, which are sold in single-use packets.[3] Currently, it is estimated that areca nut is consumed by 10–20% of the World's population in a wide variety of formulations.[4]

Nearly 267 million adults (15 years and above) in India (29% of all adults) are users of tobacco, according to the Global Adult Tobacco Survey India, 2016-17. The most prevalent form of tobacco used in India is smokeless tobacco and commonly used products are khaini, gutkha, betel quid with tobacco and zarda.[5] There was similar finding in our study. The most common method of using smokeless tobacco in our study was guthka (combination of smokeless tobacco with areca nuts). Younger people are more likely to have guthka chewing because well-known celebrities advertise the product on social media.

The male to female ratio in our study was 4.5:1 which indicates that OSMF is more prevalent among male as compared to females. The finding is consistent with the study conducted by Akshaya. K et al.[6] However there is difference in the male to female ratio. In the study done by the author the male to female ratio was found to be 6.88:1 as compared to 4.5:1 in our study. It is possible that this difference maybe due to sample size and regional variation in male and female tobacco use. But this male predilection was found to be in disagreement by the study conducted by Li N et al[7] where author reported female predominance in the OSMF cases reported. It may be a result of the ethnic differences in the preference of guthka chewing habits between men and women. Most of the patient with OSMF has history of habit for 11-15 years. That was found to be significant The youngest patient reported to Dental OPD with OSMF was 5 year old male patient. This finding is similar to the study conducted by Pratik Kariya et al. In her study author has reported the case of oral submucous fibrosis in a 5 years old male kid. The maximum number of patients with oral submucous fibrosis was found to be in the age group of 31 to 40 years. The finding of our study is in agreement with study conducted by Rahul Srivastava et al.[8] It is, however, in conflict with the study conducted by Pindborg et al[9], in which the majority of cases were reported among participants aged 40-49. Oral submucous fibrosis occurs at a younger age due to a change in how areca nuts are prepared and consumed. In recent years, pre-packaged areca nuts have become very popular among young adults. Areca nut is the fourth psycho stimulant agent It is unknown what flavoring agents are used in these pre-packaged areca nuts. Also, areca nuts with betel leaves were more commonly used previously. There is some protective benefit to betel leaves that are not present in prepacked areca nuts.

Guthka is a mixture of tobacco, crushed areca nut (also called betel nut), spices, and other ingredients.[11] As it contains both areca nut and smokeless tobacco so it is more harmful than use of areca nut or smokeless tobacco alone as smokeless tobacco and areca nut had synergistic effect together. Besides it was observed that almost 30% of gutkha brand samples exceeded the permissible levels of metals Pb and Cu, when compared to the provisional tolerable intake limits determined by the FAO/WHO.[12] Due to the harmful effects of guthka on health, the sale of guthka has been banned in 24 states and 5 union territories of India under the Food Safety and Regulation (Prohibition) Act 2011.[13] In addition to the local police, the state public health department and the Food and Drug Administration enforce the ban. The Supreme Court and higher enforcement bodies are still fighting to stop the illegal sale of gutkha, despite a significant drop in legal sales.

If we consider the use of areca nut, it is the fourth most common addiction globally following tobacco, alcohol and caffeine. It is estimated to be used by 600 million people, particularly among South, East and South-east Asian communities.[14] Among these communities, areca nuts are widely used since they are perceived to have medicinal values, including being an aphrodisiac, breath freshener, and digestive aid. It is common practice to offer these products to guests in important social gatherings, weddings and other religious events.[15] Among vulnerable groups such as children and women, this habit is ingrained as part of ethnic and cultural identity.

Role of areca nut in the pathogenesis of oral submucous fibrosis is well established. Apart from the mechanical trauma there is also chemical injury from areca nut to the oral mucosal tissue.

Four alkaloids namely arecoline, arecaidine, guvacine, and guvacoline have been identified in areca nut.[16] The arecoline in the areca nut leads to over production of collagen fibres and these fibres are less soluble than the normal collagen fibres. Beside the habit of using areca nut with slaked lime, further add on the collagen metabolism dysregulation by activating the lysl oxidase. Lysyl oxidase (LOX) is a copper-activated enzyme critical for collagen cross-linking and organization of extracellular matrix.[17] This further interfere with degradation of collagen fibres.

Furthermore, areca nut has ill effects on systemic health as well. There are almost no organs in the human body that are not affected by areca nuts, including the brain, heart, lungs, gastrointestinal tract, and reproductive system. Asthma, central obesity, type II diabetes, hyperlipidemia, metabolic syndrome, neuronal injury, myocardial infarction, cardiac arrhythmias, hepatotoxicity, and myocardial infarction are some of the pre-existing conditions that are caused or aggravated by it. Infertility, hypothyroidism, and prostate hyperplasia

can all be caused by areca nuts on the endocrine system. In addition, it decreases cytokine release and suppresses the activity of T-cells in the immune system.[18]

CONCLUSION

Oral submucous fibrosis is chronic irreversible disease with risk of malignant transformation. Use of areca nut in any form is linked to the development of the disease. The carcinogenic effect of areca nut is well established. The recent resurgence of use of pre-packaged areca nut with or without smokeless tobacco further increases its carcinogenic potential. Nationwide ban imposed by Government of India had controlled the legal sale of guthka (areca nut and smokeless tobacco) but not its illegal sale. To make any such effort effective we need to raise the awareness regarding the ill effect of areca nut chewing.

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