10.5005/jp-journals-10052-0054

ORIGINAL ARTICLE

Prevalence of Oral Submucous Fibrosis in Children of Rural Areas of Nagpur, Maharashtra, India

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ABSTRACT

Background: Younger generation has been getting habituated to areca nut and its products are easily available in attractive pouches, i.e., sweet supari, ghutka, kharra, etc. Tobacco and its products, being cheap and convenient to carry, have become popular in school children, resulting in various alteration of oral mucosa, one of them being oral submucous fibrosis (OSMF).

Aim: To assess the prevalence of OSMF in children of rural areas of Nagpur, Maharashtra (India).

Materials and methods: Cross-sectional survey was carried out among 8- to 17-year-old school children in rural areas of Nagpur, Maharashtra. Thorough oral examination was carried out for recording oral changes related to OSMF, with questions regarding use of tobacco and its products. The data thus collected was subjected to statistical analysis.

Results: Examination was carried out in 2,132 children; 7.3% children were found with the habit of chewing areca nut products, i.e., sweet supari, kharra, gutka, etc., and 2.9% children were found with OSMF.

Conclusion: Onset of disease is seen early because of use of areca nut at an early age. Lack of awareness in rural areas, deficient oral health program, and areca nut chewing being the most common factors for OSMF.

Keywords: Oral submucous fibrosis. Prevalence, Tobacco,

How to cite this article: Singh P, Mittal R, Chandak S, Bhondey A, Rathi A, Chandwani M. Prevalence of Oral Submucous Fibrosis in Children of Rural Areas of Nagpur, Maharashtra, India. Int J Prev Clin Dent Res 2016;3(4):243-245.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

In India, 30 to 40% carcinomas are oral cancers, a remarkably high prevalence, i.e., closely associated with several forms of tobacco smoking and chewing.[1] Oral submucous fibrosis (OSMF) is a high risk precancerous condition with high relative risk rate for malignant transformation of 4.5 to 7.6%.[2]

Oral submucous fibrosis is a chronic, progressive, debilitating disease, first reported from India in 1953.[3,4] Oral submucous fibrosis patients were initially isolated only in Indian population but later on reported in many Southeast populations. It is characterized by changes in the connective tissue fibers of the lamina propria, loss of its elasticity, and formation of fibrous bands in the buccal mucosa running in a vertical direction involving the tissue around the pterygomandibular raphe, leading to difficulty in mouth opening.[1,5,6]

Several etiological hypotheses for OSMF have been proposed but the chewing of areca nut is the most important etiological factor for OSMF. Areca nut is known as "supari" in India. Areca nut is the fourth most commonly used psychoactive substance in the world after caffeine, alcohol, and nicotine.[7] India is the largest producer and consumer of areca nut in the world.[8] The younger generation has been found to be getting habituated to areca nut and areca nut products are easily available in the market in different multicolored attractive pouches, i.e., sweet supari, gutka, kharra, etc. Aggressive advertising and marketing of areca nut products since early 1980s has greatly enhanced the sales of these products and these are easily available in each and every corner of rural/urban areas of all over India.[7]

Tobacco and its related products, being cheap and convenient to carry, have become popular at school age. Families of the school going children of rural area are not aware of the harmful effect because of lack of knowledge about effect of areca nut products and OSMF. Most family members of rural area are habituated to chewing kharra, gutka, and paan with supari, leaving a bad impression on child to get attracted toward areca nut products. Therefore the present study aimed to determine the prevalence of OSMF in children of rural areas of Nagpur, Maharashtra, India.

MATERIALS AND METHODS

A cross-sectional study was carried out in various schools situated in rural areas of Nagpur, Maharashtra (India). After taking consent from school authorities and legal guardians, examination was carried out with all aseptic measures.

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A total of 2,132 school going children between 8 and 17 years of age were examined. Each student was asked questions about their chewing habits, age of initiation, frequency of use, source of information about the product, reasons for use, consumption among family members, awareness about the harmful effects of the product, etc. and recorded on the data collection form.

All study subjects underwent an oral examination for OSMF, i.e., burning sensation of mouth and tongue, irritation of mouth with chilies and spicy food, blanched or opaque appearance of mucosa, difficulty or inability in opening mouth, soft palate movement restriction, and presence of palpable fibrous band. The maximal mouth opening between upper and lower incisor edges of each study subject was measured and recorded with a scale covered with disposable, transparent plastic sheet. The data thus obtained was subjected to statistical analysis.

RESULT

Out of 2,132 children, 156 (7.3%) children were active chewers of areca nut and its products. Genderwise distribution based on the presence/absence of habit is illustrated in Table 1.

Sixty-two children exhibited clinical signs of OSMF, thus the resultant prevalence of OSMF was obtained to be 2.9%. These 62 children were found out of 156 children (7.3%) reported with the habits of chewing areca nut in the form of sweet supari, gutka, and kharra.

The incidence of development of OSMF was directly related to the frequency and duration of consumption of areca nut (Tables 2 and 3).

Table 1: Genderwise distribution based on the presence/absence of habit

Sl. no.	*Subjects*	*Male (%)*	*Female (%)*	*Total (%)*
1	Total subjects	1119 (52.5)	1013 (47.5)	2132 (100)
2	Subjects without habit	1005 (47.1)	971 (45.5)	1976 (92.7)
3	Subjects with habits	114 (5.3)	42 (1.9)	156 (7.3)
4	Subjects with OSMF	52 (2.4)	10 (0.5)	62 (2.9)

Table 2: Frequency of sachets usage in children

Frequency of sachets	*Frequency (%)*	*OSMF (%)*
Sweetened areca nut chewers	113 (5.3)	33 (1.54)
Weekly but not daily	44 (2.1)	0 (0)
1 Sachet daily	38 (1.8)	14 (0.65)
1–3 Sachets daily	22 (1)	13 (0.60)
More than 4 sachets daily	9 (0.42)	6 (0.28)
Kharra, Gutka chewers	43 (2.01)	28 (1.31)
Weekly but not daily	6 (0.28)	0 (0)
1 Sachet daily	16 (0.75)	10 (0.69)
1–3 Sachets daily	13 (0.60)	11 (0.51)
More than 4 sachets daily	8 (0.37)	7 (0.32)

The severity of symptoms in relation to OSMF and the associated reduction mouth opening in children is illustrated in Tables 4 and 5 respectively.

DISCUSSION

Areca nut is the most common product people are addicted to, followed by tobacco, alcohol, and caffeine. Areca nut is said to cause precancerous conditions but apart from the carcinogenic potential, it is also addictive resulting in development of dependence symptoms.[9] Prolong areca nut chewing habit causes acute effects like exacerbation of asthma, hypertension, and tachycardia.[10] Gutka is a mixture of tobacco along with areca nut, slaked lime, catechu, and condiments marketed commercially. Whereas kharra is a cheaper option containing similar contents with high tobacco concentration made locally by vendors. Consuming the combination of areca nut and tobacco leads to development of oral cancers, chronic obstructive pulmonary disease, cardiovascular diseases.[11]

In the present study, most of the children belonged to the lower socioeconomic strata, and had high affinity to usage of areca nut products. Similarly, Shah et al[12] had reported high frequency of areca nut use especially among children of lower socioeconomic strata, increasing the chances of development of OSMF.

The prevalence of use of tobacco and its associated products (7.37%) in the present study was much lower in comparison with the study by Agarwal et al[13] and Neufled et al,[14] who reported the prevalence to be 34.1 and 16.2% respectively.

Table 3: Duration of habit in children

Duration	*Frequency (%)*	*OSMF (%)*
1–6 months	31 (1.45)	0 (0)
6–12 months	42 (1.96)	10 (0.46)
More than 1 year	56 (2.62)	28 (1.31)
More than 3 years	27 (1.26)	23 (1.07)

Table 4: Severity of symptoms in relation to OSMF in children

Severity of symptom	*Frequency*	*Percentage*
Burning sensation and ulceration	29	1.36
Blanching of oral mucosa	20	0.93
Reduced mouth opening	12	0.56
No symptom	95	4.45

Table 5: Frequency of reduced mouth opening in OSMF children

Reduced mouth opening	*Frequency*	*Percentage*
0 to 1 cm	0	0.0
1.1 to 2 cm	1	0.04
2.1 to 3 cm	3	0.14
3.1 to 4 cm	8	0.37

The prevalence of OSMF in the present study was 2.86% whereas Agarwal et al[13] reported prevalence of OSMF as 5.4% in the age group of 13 to 19 years.

Habit of areca nut chewing was found more in boys (5.3%) than girls (1.9%). Similar result were reported by Khandelwal et al[15] and Mazahir et al.[16] The contributing reason for this difference may be more social acceptance of use of areca nut and its associated products in males than females.

Commercially, areca nut is available in two forms, i.e., areca nut without tobacco, e.g., supari, sweet supari, etc., and areca nut containing tobacco, e.g., gutka, kharra, pan masala, etc. containing dry mixture of crushed areca nut, tobacco, catechu, lime (calcium hydroxide), aromas and flavoring as well as additives. In the present study, the most prevalent forms of substances used were sweet areca nut, gutka, and kharra. In early age, children are more attracted toward sweet supari pouches. Therefore, in the present study sweet supari (sweetened areca nut) was found most popular in the age of 8 to 13 years while kharra and gutka in the age of 14 to 17 years.

Khan et al[17] reported that the majority of subject chewed 1 to 3 sachets daily of areca nut. In the present study, a range of variation was observed in relation to the frequency of consumption of tobacco containing as well as tobacco-free areca nut products. Also, a linear proportion was exhibited between the increasing frequency and duration consumption of tobacco and its related products and establishment of OSMF.

Burning sensation and ulceration was the most common system reported, followed by blanching of oral mucosa and reduced mouth opening in the subjects reported with OSMF. Most of the subjects diagnosed with OSMF had reduced mouth opening ranging between 3.1 and 4 cm. However, in the present study, reduced mouth opening as less as 1.4 cm was reported in 8-year-old female subject. To the best of authors' knowledge, this is the first study to measure the mouth opening in children diagnosed with OSMF.

CONCLUSION

The present study provides information about OSMF disease in school-going children of rural areas and their attraction toward areca nut products at an early age because of ease of availability near schools.

Dental health education program about the harmful effect of areca nut and its related products must be included in the school curriculum and awareness camp be held in rural areas on regular basis for the education of children as well as parents.

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