

Prevalence of Oral Submucous Fibrosis in Children of Rural Areas of India

Manish Kumar¹, Premchand Kumar¹, Binita Venu Gopal², Rohit Singh³, Ashok Kumar³, Vijayendra Pandey⁴

¹Department of Oral Medicine and Radiology, Vananchal Dental College and Hospital, Garhwa, Jharkhand, India.

²Department of Orthodontics, Vananchal Dental College and Hospital, Garhwa, Jharkhand, India.

³Department of Pedodontics, Vananchal Dental College and Hospital, Garhwa, Jharkhand, India.

⁴Department of Dentistry, Manipal Tata Medical College, Jamshedpur, Jharkhand, India.

Abstract

Introduction: Oral submucous fibrosis (OSMF) has now been recognized and accepted as an Indian disease. It is one of the dreadful diseases which has the highest rates of malignant transformation. The prevalence of this deleterious habit in India is on rise so that this disease is reported to be rare which has now become very common. Hence, the awareness about its clinical features, diagnosis, and management is the main feature to curtail this menace. **Materials and Methods:** A total of 2175 school going children between 8 and 17 years of age were examined. All study subjects had undergone oral examination for OSMF. The data thus obtained were further subjected to statistical analysis. **Results:** Sixty-seven children exhibited clinical signs of OSMF, thus the resultant prevalence of OSMF was obtained to be 3.08%. These 67 children were found out of 159 children reported with the habits of chewing areca nut in the form of sweet supari, gutka, and kharra. **Conclusion:** Dental health education program regarding the harmful results of areca nut and its related products must be included in the syllabus of the school curriculum and awareness camp to be held in rural areas on routine monthly or biannual basis for the education of children and their parents.

Keywords: Oral submucous fibrosis, Areca nut, Prevalence.

INTRODUCTION

Shushrutha who is considered as the pioneer in the era of ancient medicine described a condition where “vidari” which means diseases arising from mouth and throat areas. He also observed the progressive narrowing of mouth, oral mucosal depigmentation, and pain on taking food (dysphagia). These clinical presentations were meticulously fit in with the signs and symptoms of oral submucous fibrosis (OSMF).^[1] Schwartz (1952) for the first time reported a case of “atrophicaidiopathicatropica mucosae oris” which occurs in Indians in East Africa. Lal and Joshi in the year 1953 were the first elaborated this condition in India. The term “OSMF” was first coined by Joshi.^[2] Pindborg and Sirsat (1966) explained histologically about the four consecutive stages of the OSMF.^[3] Seedat and Van Wyk (1988) have briefed about the irreversible nature of the disease which means that once OSMF is initiated by the habit of chewing betel nut, the reversal of the lesion could not be possible even after the cessation of the habit.^[4]

Based on the facts proposed in the year 2004 review, India holds the highest rank on the number of oral cancer cases reported in a year which is estimate to be around 75,000–80,000 cases which

clearly explains the magnitude of the lesion. For many years, this condition had been basically bound to be confined only in certain countries like India, Pakistan, Bangladesh but now due to higher rates of immigrants, this condition is being reported in Western countries as well.^[5-7] Moreover, this epidemic part is due to the sudden and rapid spurt in the number of industries that is involved in a convenient and inexpensive packaging and vigorous advertising of certain products such as gutkha and paan masala which was commercially started advertising from the year 1980 in countries like India. Strict actions to be taken in curbing this serious health issue by the Government are majorly missing basically due to the anxiety of affecting the livelihood of farmers and others involved in this household industry. Major portion is contributed by Karnataka, a

Address for correspondence: Dr. Rohit Singh, Department of Oral Medicine and Radiology, Vananchal Dental College and Hospital, Garhwa, Jharkhand, India. E-mail: rohitped0604@gmail.com

Received: Mar. 11, 2022; **Accepted:** Apr. 16, 2022; **Published:** May. 29, 2022

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to cite this article: Kumar M, Kumar P, Gopal BV, Singh R, Kumar A, Pandey V. Prevalence of Oral Submucous Fibrosis in Children of Rural Areas of India. J Res Adv Dent 2022;13(4):117-120.

Access this article online

Website:
www.jrad.co.in

DOI:
<https://doi.org/10.53064/jrad.2022.13.4.214>

state of India which grows about 65% of the total areca nut that is being produced in the country. However, a ban was just recently imposed on gutkha after several other states that has banned the product under the Food Safety and Standards Act (FSSA). Farmers who are involved in this field need to be well-educated regarding the adverse effects and encouraged to grow other crops which could actually bring them profits.^[5,8] The World Health Organization claims that the deaths due to tobacco in India might exceed 1.5 million annually by 2020. Oral cancer may progress through the transformation of tobacco exposed normal oral mucosa to potentially malignant lesions which could ultimately changes to carcinoma. OSMF is now considered as the globally accepted Indian disease and it has also been considered as one of the diseases that has the highest rates of malignant transformation among potentially malignant oral lesions.^[9,10]

The role of a primary health-care physician in early diagnosis of OSMF is highly unavoidable while considering its progressive nature. Since it is considered as a restrictive condition of oral cavity with multifactorial etiologies with areca nut chewing is the most common one. The prevalence of this deleterious habit in India is on rise so that this disease is reported to be rare which has now become very common. Hence, the awareness about its clinical features, diagnosis, and management is the main feature to curtail this menace. Therefore, role of primary health-care physician being the first point of contact for the general population. The present study was conducted to assess the prevalence of OSMF among children considering various age groups.

MATERIALS AND METHODS

A cross-sectional study was carried out in various schools present in rural areas. After taking informed consent from school authorities and/or legal guardians, clinical examination was carried out with all aseptic measures that have been followed.

A total of 2175 school going children between 8 and 17 years of age were examined. Each student was asked about questions regarding their chewing habits, age of initiation, frequency of use, source of information about the product, consumption among the family members, awareness about the harmful effects of the product, and recorded on the data collection form which have been provided to all the study participants. All study subjects had undergone oral examination for OSMF, that is, burning sensation of mouth and tongue, irritation of mouth while having 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 collected and recorded with a scale which is covered with disposable and transparent plastic sheet. The data thus obtained were further subjected to statistical analysis.

RESULTS

Out of 2175 children, 159 (7.3%) children were active chewers of areca nut and its products. Gender-wise distribution based on the presence/absence of habit is illustrated in Table 1.

Sixty-seven children exhibited clinical signs of OSMF, thus the resultant prevalence of OSMF was obtained to be 3.08%. These 67 children were found out of 159 children reported with the habits of chewing areca nut in the form of sweet supari, gutkha, 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).

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

Table 1: Gender-wise distribution based on the presence/absence of habit

S. No.	Subjects	Male (%)	Female (%)	Total (%)
1.	Total participants	1141 (52.5)	1034 (47.5%)	2175 (100)
2.	Participants without habit	1024 (47.1)	989 (45.5)	2013 (92.5)
3.	Participants with habit	115 (5.3)	41 (1.9)	156 (7.3)
4.	Participants with OSMF	52 (2.4)	11 (0.5)	63 (2.9)

Table 2: Frequency of sachets usage in children

Variables	Frequency	OSMF (%)
<u>Sweetened areca nut</u>	115 (5.3)	34 (1.54)
Weekly but not daily	48 (2.1)	0 (0)
1 sachet daily	41 (1.8)	14 (0.65)
1–3 sachets daily	24 (1)	13 (0.6)
More than 4 sachets daily	11 (0.42)	6 (0.28)
<u>Kharra, Gutka</u>	47 (2.03)	29 (1.31)
Weekly but not daily	8 (0.43)	0 (0)
1 sachet daily	19 (0.79)	11 (0.69)
1–3 sachets daily	15 (0.62)	10 (0.51)
More than 4 sachets daily	11 (0.39)	7 (0.32)

Table 3: Duration of habit in children

Duration	Frequency (%)	OSMF (%)
1–6 months	32 (1.47)	0
6–12 months	43 (1.97)	0.46
More than 1 year	57 (2.62)	1.31
More than 3 years	27 (1.24)	1.08

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

Symptoms severity	Frequency (%)	Percentage
Burning sensation and ulceration	30	1.36
Oral mucosal blanching	21	0.94
Reduced mouth opening	13	0.57
No symptoms	96	4.47

Table 5: Frequency of reduced mouth opening in OSMF children

Restricted mouth opening	Frequency (%)	Percentage
0–1 cm	0	0.0
1.1–2 cm	1	0.06
2.1–3 cm	4	0.17
3.1–4 cm	9	0.39

DISCUSSION

People these days are more addicted toward the areca nut which is followed by tobacco, alcohol and caffeine. Areca nut is reported to cause precancerous conditions with its carcinogenic potential, it is also said to be addictive resulting in the clinical picture of dependence symptoms.^[11] The habit of prolonged areca nut chewing results in acute effects like exacerbation of asthma, hypertension, and tachycardia.^[12] Gutka which is a mixture of tobacco along with areca nut, slaked lime, catechu, and condiments was marketed commercially whereas kharra is a cheaper alternative containing similar contents with higher tobacco concentration made locally by vendors. When consuming the combination of areca nut and tobacco could possibly result in the development of oral cancers, chronic obstructive pulmonary disease, and cardiovascular diseases.^[11] In the present study, most of the children belong to the lower socioeconomic strata and hence had a high affinity to the usage of areca nut products and their cheaper alternative. Similarly, Shah *et al.*^[13] had reported high frequency of areca nut use particularly among children of lower socioeconomic strata which results in increased chances of development of OSMF. The prevalence of the use of tobacco and its related products (7.37%) in the present study was reported much lower when compared with the study conducted by Agarwal *et al.*^[14] and Neufeld *et al.*^[15] who reported the prevalence to be 34.1 and 16.2%, respectively.

The prevalence of OSMF in the present study was 2.85% whereas Agarwal *et al.*^[14] reported the prevalence of OSMF as 5.4% in the age group of 13–19 years. The habit of areca nut chewing was seemed more in boys (5.3%) than girls (1.9%). Almost identical results were reported by Khandelwal *et al.*^[16] and Mazahir *et al.*^[17] The contributing reason for this difference could be attributed to the fact that more social acceptance of use of areca nut and its associated products in males than females. Commercially, there are two forms of areca nut that is available, that is, areca nut without tobacco, for example, supari, sweet supari and areca nut containing tobacco, e.g., gutka, kharra, paan masala containing the dried mixture of crushed areca nut, tobacco, catechu, lime (calcium hydroxide), aromas, and few flavouring agents as well as additives. In the present study, the most prevalent forms of substances used were reported to be sweet areca nut, gutka, and kharra. In the early age, children are more attracted toward sweet supari pouches. Hence, in the present study, sweet supari (sweetened areca nut) was found to be the most popular in

the age of 8–13 years while kharra and gutka were commonly used in the age group range of 14–17 years. Khan *et al.*^[18] reported that the majority of subject chewed 1–3 sachets daily of areca nut. In the present study, a range of variation was relatively observed in relation to the frequency of consumption of tobacco present as well as tobacco-free areca nut products. Moreover, a linear proportion was observed between the increasing frequency and duration consumption of tobacco and its associated products and the establishment of OSMF. Burning sensation and ulceration were the most common system reported which is followed by blanching of oral mucosa and restricted mouth opening in the subjects who are reported positive with OSMF. The most of the study subjects were diagnosed with OSMF that had reduced mouth opening ranging between 3.1 and 4 cm. However, in the present study, restricted mouth opening seems to be around <1.4 cm which was reported in 8-year-old female subject.

CONCLUSION

Dental health education program regarding the harmful results of areca nut and its related products must be included in the syllabus of the school curriculum and awareness camp to be held in rural areas on routine monthly or biannual basis for the education of children as well as their parents. The present study has enough information about OSMF disease among school-going children of rural areas and their interest toward areca nut products at an early age because of the ease of availability near schools.

REFERENCES

- Gupta SC, Yadav YC. "MISI" an etiologic factor in oral submucous fibrosis. *Indian J Otolaryngol* 1978;30:5-6.
- Joshi SG. Submucous fibrosis of the palate and the pillars. *Indian J Otolaryngol* 1953;4:1-4.
- Pindborg JJ, Sirsat SM. Oral submucous fibrosis. *Oral Surg Med Oral Pathol* 1966;22:764-79.
- Seedat HA, Van Wyk CW. Submucous fibrosis (SF) in exbetel nut chewers: A report of 14 cases. *J Oral Pathol Med* 1988;17:226-9.
- Nair U, Bartsch H, Nair J. Alert for an epidemic of oral cancer due to use of the betel quid substitutes gutkha and pan masala: A review of agents and causative mechanisms. *Mutagenesis* 2004;19:251-62.
- Pickwell SM, Schimelpfening S, Palinkas LA. "Betelmania" Betel quid chewing by Cambodian women in the United States and its potential health effects. *West J Med* 1994;160:326-30.
- Van der Waal I. Potentially malignant disorders of the oral and oropharyngeal mucosa; terminology, classification and present concepts of management. *Oral Oncol* 2009;45:317-23.
- Hazarey VK, Erlewad DM, Mundhe KA, Ughade SN. Oral submucous fibrosis: Study of 1000 cases from central India. *J Oral Pathol Med* 2007;36:12-7.
- Murray CJ, Lopez AD. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and Projected to 2020*. Cambridge, Massachusetts: Harvard School of Public Health; 1996.
- Bansal SK, Leekha S, Puri D. Biochemical changes in OSMF. *J Adv Med Dent Sci* 2013;1:101-5.
- Wikimedia Foundation. Available from: http://en.wikipedia.org/wiki/Areca_nut [Last accessed on 2010 Jan 10].
- Joseph N, Nagaraj K, Shashidhar KM. Arecanut and tobacco use among school children in a village in South India a cross-sectional study. *Aust*

- Med J 2010;3:299-303.
13. Shah S, Qureshi R, Azam I. Practice and knowledge of school children regarding chhaalia/pan masala in Mahmoodabad and Chanesar Goth, Karachi. J Pak Med Assoc 2008;58:678-83.
 14. Agrawal A, Chandel S, Singh N, Singhal A. Use of tobacco and oral sub mucous fibrosis in teenagers. J Dent Sci Res 2012;3:1-4.
 15. Neufeld KJ, Peters DH, Rani M, Bonu S, Brooner RK. Regular use of alcohol and tobacco in India and its association with age, gender, and poverty. Drug Alcohol Depend 2005;7:283-91.
 16. Khandelwal A, Khandelwal V, Saha MK, Khandelwal S, Prasad S, Saha SG. Prevalence of areca nut chewing in the middle school-going children of Indore, India. Contemp Clin Dent 2012;3:155-7.
 17. Mazahir S, Malik R, Maqsood M, Merchant KA, Malik F, Majeed A, *et al.* Socio-demographic correlates of betel, areca and smokeless tobacco use as a high risk behavior for head and neck cancers in a squatter settlement of Karachi, Pakistan. Subst Abuse Treat Prev Policy 2006;1:10.
 18. Khan MA, Siddiqui HK, Hasan T. Prevalence of areca nut eating habits and incidence of oral submucosal fibrosis in school children a prospective cross-sectional survey. Pak Oral Dent J 2014;34:462-6.