

Prevalence of Oral Submucous Fibrosis in School Going Children Who Chew Betel Nut Versus Those Who Do Not: A Cross Sectional Study

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ABSTRACT

Objective: The aim of this cross-sectional study in Central District of Karachi (CDK) was to assess the prevalence of oral soft tissue lesions and to investigate associations which may exist between oral conditions and Betel nut (BN) chewing among the young school going children.

Study Design: Cross-Sectional Study

Place and Duration of Study: This study was conducted at Dental Department, Baqai University, Karachi, from April 2011 to July 2011.

Materials and Methods: Questionnaire based research was conducted. Three hundred and sixty students from 17 different schools participated in the study. The mean age was 13.86 ± 1.2 years with the age range of 12 to 16 years. Out of these 360 students, 175 were females and 185 were males.

Results: The results showed a high prevalence of the pre-cancerous lesion, oral submucous fibrosis among BN chewers (BNC) compared to non-chewers (NBNC) (19% and 3% respectively). The high prevalence of BN chewing (59% of the low socio-economic young population studied) should be addressed at local and government level through support for effective preventive programs and health promotion campaigns.

Conclusion: Promotion of oral health and eradication of BN chewing are important goals for the prevention of oral cancer among this population.

Key Words: Oral submucous fibrosis, Betel nut, Betel nut chewing

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INTRODUCTION

The chewing of betel nut (BN) is an old practice in South-Rast Asia, especially in the Indian subcontinent¹. This tradition is inherited generation after generation and has become a popular cultural activity among people of Pakistan, India, Sri Lanka and Bangladesh². BN is a fruit of areca tree that widely grows in tropical Pacific, Asia and east Africa. It is a small feathery palm that grows to the height of 1.5 m. The most common method of using BN is to chop it into very small pieces with the help of an especial instrument known in local language - Urdu as "sarota". Slurry of slaked lime and catechu boiled in water is applied on a betel leaf and the chopped pieces of BN are rolled in it to be kept in mouth. This leaf package is generally referred to as

betel quid (Paan). Some chewers like to add tobacco in it and others use it without tobacco.

Gutkais a new product introduced in early 1990's by tobacco industry in India. It is a preparation of crushed BN, tobacco, catechu, paraffin, slaked lime with sweet and aromatic flavors³ available in small sachet of 20-50 gm. Gutka is placed in the mouth or chewed and it remains in contact with oral mucosa for variable period of time depending upon the intensity of the habit of the chewer. These products are commonly chewed for their psychoactive effects of well being⁴.

It has also been found in a study that the consumption of BN / Gutka / paan is higher in the areas of low socio economic status due to cheap production of unpackaged local manufacturing at home⁵. BN contains the alkaloid arecoline in addition to nitrosamines, which is carcinogenic. Various studies have been conducted to determine the relation of BN and other alternative chewing material to oral and other associated cancers^{6,7}. It has been proved that BN, Gutka and Paan cause oral cancers^{8,9} and alone in India, out of 700,000 cancers diagnosed each year 300,000 cases relate to tobacco smoking and BN chewing¹⁰. A study done in

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Pakistan reveals that the use of tobacco with lime has been recognized as a risk major factor for oral and throat cancers¹¹. The use of these substances induces fibroblast proliferation and collagen production and thus it is strongly associated with oral sub mucous fibrosis, a crippling and precancerous condition¹².

It is known that adults are indulged in BN/Paan/Gutka chewing and there is an increasing concern that children are now using these products¹³. This chewing habit is posing health problems in children and adolescents¹⁴. As in adults, this may lead to serious oral health conditions such as oral submucous fibrosis (OSF), mouth ulcers (MU), staining of the teeth and gums, leukoplakia (LPK) and other precancerous lesions which lead to oral cancers^{15,16}. Several studies have reported that the habit of BN chewing often tends to start at a very young age but none have provided any specific age group^{17,18}. Cause of concern is the intensity of consumption of these products by children. According to findings of a study, 94 % of school goers consume BN and 73 % chew Gutka¹³.

MATERIALS AND METHODS

A cross sectional study was conducted in CD, Karachi. A research questionnaire was prepared, and sent along with the parental consent and student assent forms to the Clinical Research Ethics Committee of Baqai Medical University, Karachi for this study. The questionnaire was scrutinized by the subject specialists and was coded for statistical purposes. The sample comprised of 360 students from 17 different schools in CD, Karachi. The age range of sample population was 12 - 16 years. The schools were picked up randomly from low socioeconomic residential areas in CD. Two groups of students were randomly picked (BNC and NBNC) from each school. Parental consent, student assent, and confidential medical history form were also sent to the parents/guardian. They were asked to return all of the completed forms duly signed. The inclusion criteria were: 1. subjects in the age range of 12-16 years, 2. Subjects were able and willing to cooperate in all the study procedures, 3. Subjects were in good general health. 4. Subjects whose parent/guardian signed the informed consent form, 5. Subjects who signed the consent form, and 6. Subjects known to be non-allergic to any dental products.

Statistical Analyses: SPSS Version 18 was used for statistical analysis.

RESULTS

The sample comprised of 360 students who were selected from seventeen secondary schools in the CD. This sample size represents the power of the study after comparing with the previous available studies showing the prevalence of BN chewing between 70% and 75%. These schools were randomly selected in a recognized low socio-economic area based on high unemployment

and a low educational standard. Out of the 360 students, 51.38% were males (n=185) and 48.61% were females (n=175). The mean age was 13.86 ± 1.2 years with the age range of 12-16 years. The sample is summarized by gender and year of education in Figure 1, and by gender and age in Figure 2.

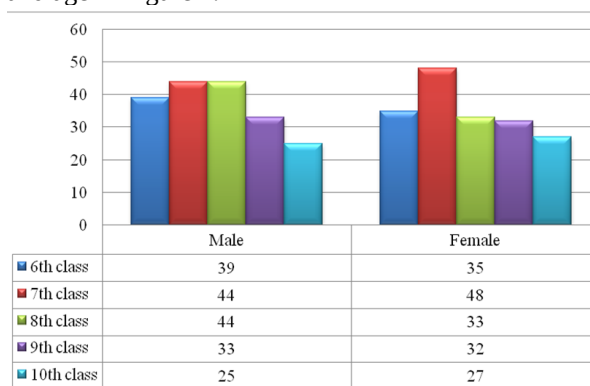


Figure 1. A comparison between gender and the years of education of subjects

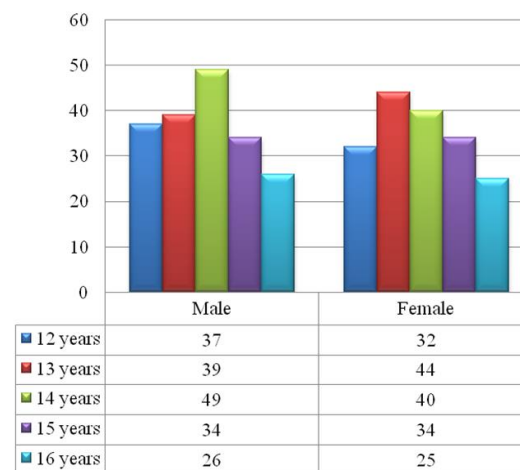


Figure 2. A comparison of Gender and age of the subjects

Number and percentage of BNC and NBNC is given in Table 1 which shows that 58.61% of the examined subjects were in the habit of BN chewing.

Table 1: Percentage (%) of study participants involved in BN chewing

Betel Nut Chewing	n	%
Yes	211	58.61
No	149	41.39

In table 2, BN chewing habit among gender is shown separately which illustrates that 61.61% of males and 38.39% of females chewed BN

Table No.2: BN chewing and gender distribution

Betel nut chewing	Males % (n)	Females % (n)
Yes	61.61 (130)	38.39 (81)
No	36.91 (55)	63.08 (94)

A chi-square test was performed to examine the difference in the habit of BN chewing among males and females. The difference between these variables was significant, $X^2 = 21.32$, $df = 1$, $p < 0.001$. Almost twice the numbers of males (61.61%) chewed betel nut as compared to females (38.39%).

The association between oral submucous fibrosis and betel nut chewing: Two types of oral lesion were reported, Oral Submucous Fibrosis (OSF) and Traumatic Ulcers (TU). When OSF was analyzed among BNC and NBNC, it was noted that 19.43% of BNC and 2.69 of NBNC had OSF (Table 3).

Table No.3: Presence of oral OSF between BNC and NonBNC

OSF	Yes % (n)	No % (n)	Total % (n)
BNC	19.43 (41)	80.57 (170)	100 (211)
NonBNC	2.69 (4)	97.31 (145)	100 (149)

A chi-square test was performed to examine the difference in the presence of OSF between BNC and NBNC. There was a significant difference, $X^2 = 22.39$, $df = 1$, $p < 0.001$.

Oral submucous fibrosis among male and female betel nut chewers: Among males, 23.85% of BNC had OSF, compared with 7.27% of NBNC; this difference according to BN chewing also existed for females with 12.34% of female BNC having OSF compared with 0% of NBNC (Table 4)

Table No.4: OSF and Gender Distribution

BNC		Non BNC	
Male % (n)	Female % (n)	Male % (n)	Female % (n)
23.85 (31)	12.34 (10)	7.27 (4)	0 (0)
76.15 (99)	87.65 (71)	92.73 (51)	100 (94)
100 (130)	100 (81)	100 (55)	100 (94)
100 (211)		100 (149)	

A chi square test was performed to examine the difference in the presence of OSF between male gender and BN chewing. The difference between these variables was significant, $X^2 = 6.92$, $df = 1$, $p < 0.009$.

DISCUSSION

Habit of chewing BN and Gutka is popular among young students of CDK who belong to financially poor families. According to the results of this study, significantly more males (61.61%) chewed BN than females (38.39%). These findings are similar to the findings of two previous studies^{19,20}. A study conducted in United Kingdom by Farrand et al, in a sample of 704 children aged between 11- 15 years, showed a high

prevalence of BN chewing among males belonging to the Asian community. In Karachi, males have freedom to go and spend time outside the home, which makes them more exposed to the habit whereas females are restricted to do so. In a study, the majority of students claimed that they often saw BN vendors near their residential areas, and some reported that BN vendors were situated near their schools²¹. Boys have a higher exposure to BN as compared to girls. This may be the possible reason of its higher prevalence among males.

The highest proportion (44.07%) of children chewed BN twice a day, 36.01% once a day and 19.92% more than twice a day. Among them, 50.78% of males as compared to 33.33% of females were chewing BN twice a day, and 25.38% of males and 11.12% of females were chewing BN more than that. The high proportion of children identified as chewing BN may pose difficulties for their future health as Shah and Sharma found in a case control study that an increasing frequency of BN chewing is associated with oral soft tissue problems¹³. These findings are supported by the results of many studies done in past^{17,22,23}. Increased frequency of use is directly proportional to the low cost and eases of availability. These two factors should be addressed and appropriate steps should be taken to control the use of BN.

In this study, 19.43% of BNC and 2.69% of NBNC had OSF. These findings are similar to the studies of Trivedy et al⁷, Shah & Sharma¹³, Sinor et al²² and Maher et al²⁴ Ma et al²⁵. As mentioned earlier, OSF is a precancerous lesion and can lead to a significant burden of disease requiring expensive and invasive treatment. The findings of this study should help to educate children, parents, teachers and primary health workers and allow the development of preventive strategies against BN chewing.

This cross sectional study examined the prevalence of oral soft tissue lesions among BNC and NBNC from a sample of 360 school children, and produced findings which are consistent with the results of other studies. However, the targeted population belonged to a low socio economic area in a particular district of Karachi. During the data collection period, civil un-rest made recruitment to the study and data collection difficult and therefore the results may not be representative of the whole population of Karachi.

CONCLUSION

The study has provided a considerable amount of basic data and even though the analysis is limited due to short time frame, the author intends to use the data to explore further associations with multiple logistic regressions. As this study expresses a significant prevalence of BN chewing in this group, it is imperative develop an

advocacy and awareness program as an important preventive health initiative.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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