ORIGINAL ARTICLE

Effect of Smokeless Tobacco (ST) and Areca Nut chewing among adults in Gulyana Village Pakistan

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ABSTRACT

Background: Smokeless tobacco (SLT) and areca nut have now become a socially and culturally acceptable trend. Evidence has shown that it is causally associated with the development of oral precancerous and cancerous lesions which now has become a public health concern.
Aim: To determine the relationship between lesions in oral cavity and smokeless tobacco and to find the factors that are related to the impact of its usage among the target population.
Methods: A community-based cross-sectional study was done at Gulyana village, Pakistan. A sample of 323 adults was selected for the study. Data collection tools were structured questionnaire and oral cavity examination form. After taking informed consent, oral examination of respondents was done with the naked eye by using a wooden spatula in a good source of light. Logistic regression was applied to explore the coalition between smokeless tobacco use and oral lesions by using SPSS version 17.
Results: Out of 323 individuals, 120 were ST user. 67.5% were males and 32.5% were female. The prevalence oral lesions among respondents were 31.7%. The use of ST and areca nut was 37.2% and 30.9% respectively. Odds of developing oral lesion among users was higher than non-users (Adjusted OR = 30.54, 95% C.I. = 11.87-78.59). Gender, low education status, use among friends and family were significant predictors of SLT use.
Conclusion: A significant association was found between smokeless tobacco and oral lesions. Interventions are needed to target vulnerable groups to control SLT usage.
Keywords: Smokeless tobacco, Areca nut, Oral hygiene status, Oral precancerous and cancerous lesions.

INTRODUCTION

Tobacco consumption has become a major public health concern and also cause of death in the United States of America and developing world (CDC, 2015). According to WHO Report on the Global Tobacco Epidemic 2015, the prevalence of smokeless tobacco (SLT) use among young Pakistani individuals found to be overall 5.3% compared to that of 13.5% among adults[1]. Oral cancer in Pakistan is the second most common malignancy resulting mortality rates for males is 5.3 and 2.6 and for females 2.6 and 1.2 [2].

Socio-cultural factors involved are accessibility, affordability, ease of use as compared to other types of addiction. A similar study showed the prevalence of SLT usage as 18.44% among youths[8]. Another study conducted by in Karachi in 2007 found the prevalence of tobacco use was 16.1 % among high school students (only males)[10]. It turned out to be 26.8% in a study conducted in south India[3].

Well established reports state that smokeless tobacco has the potential risk for oral cancer development[3]. According to WHO, tobacco use kills more than six million people per year worldwide. Out of which 5 million deaths are caused by direct use while more than 600,000 by indirect use[4].There are two types of Smokeless tobacco i.e. chewing tobacco and sniff[5]. The main ingredient of many SLT products is Areca nut, commonly known as chalia, used alone or in tobacco mixture.

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The purpose of the study is to identify the factors responsible for increasing consumption of Smokeless tobacco and to determine its cause of development of oral lesions.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in Gulyana village, Tehsil Gujar Khan from July 2015 to December 2015.
Sampling: All the adult individuals (18 years and above) were selected for the study. The individuals who were severely ill or unwilling were excluded. A sample of 323 individuals was selected by using a formula for calculating proportion from Open Epi. The population of the village was 21,000; while the anticipated proportion of oral lesion was taken (25%) based a study conducted in India[6]. Sample size, n = [DEFF*Np (1-p)]/[(d2/z2 1-α/2*(N-1)+p*(1-p)]. Where, Population size (finite population correction factor) (N) = 21000 Confidence level (d) = 95% Hypothesized % frequency of outcome factor in population (p) = 25% ± 5[6].

After calculation, a sample of 323 was obtained. The number of households which were visited to complete the sample was 81. After visiting the first household, the second household was the one which was nearest to the first. The houses were selected conveniently because they were located distantly.
Data Collection Tools: Data were collected through structured questionnaire and observation forms for oral visual examination. The questionnaire was bilingual i.e. In English and Urdu languages.
Examination protocol: Oral examination was done by naked eye using a wooden spatula to get an idea about oral hygiene, cavities, level of plaque and calculus, and signs of oral lesions.

The findings like swellings in the tissue, texture, changes in colour, areas of tenderness or asymmetry was noted by intraoral examination. The sites like the tongue, floor of mouth, hard & soft palate were examined visually to identify leucoplakia, erythroplakia, ulceration, induration and fibrotic sub mucosal bands [7].

Plan of analysis: Descriptive statistics were run to measure frequency and percentages. All information about sociodemographic characteristics mainly age in years, sex, education status, occupation, ethnic groups, marital status were carried out. History and consumption pattern of smokeless tobacco and information about oral hygiene were also measured likewise. Data were expressed as frequency tables. Inferential statistics were carried out to assess the relationship; it was done in two parts. For example, Chi-square was carried out to find the relationship between smokeless tobacco use and gender groups, etc. While logistic regression was run to find out the existence of oral lesion by usage of smokeless tobacco expressed as odds ratios with their 95% confidence interval.

RESULTS

A total of 323 participated in the study. The males were 178(55.1%) and females were 145(44.9%). The mean age of respondents was 34.7 years. Majority of respondents 144(44.6%) belonged to age group of 18 to 28 years.

Oral Health: The overall oral hygiene status of respondents was very poor. A significant number of respondents were having high levels of plaque 276(86%) and calculus 248(77.3%). Majority 272(84.2%) of respondents reported brushing their teeth at least once a day. A greater proportion of individuals 80% used toothpaste to clean their teeth while 11% used tooth powder for this purpose (Table 1).

Table 1: Oral hygiene status and practices

Characteristic Variables	Categories	N	%
Plaque		276	86
Calculus		248	77.3
Oral hygiene status	Good	27	8.4
	Poor	122	38
	Very poor	172	53.6
Tooth brushing	Yes	267	84.2
	No	44	13.9
	Any other way of cleaning	6	1.9
Frequency of cleaning	Once a day	256	85
	Twice a day	31	10.3
	After some days	2	.6
	Any other	13	4.3
Material to clean teeth	Tooth paste	253	79.3
	Miswak	15	4.7
	Tooth powder	35	11
	Dandasa	15	4.7
	Any other	1	.3
Ever visited a dentist	Yes	138	42.9
	No	184	57.1

Oral Lesions: The prevalence of oral lesions among respondents was 31.7% (95% C.I; 7.02 – 13.55) The most prevalent oral lesion was abrasion 43.3%, followed by gum disease, dryness of mouth, limited mouth opening, white lesion and red lesion. Only 35(15%) respondents reported that they had noticed a change in oral cavity while 248(76.7%) did not notice any change. All findings on examination of respondents' oral cavities are described in table 2.

Table 2: Findings on oral visual examination

Characteristic Variables	n	%age
Gum disease	136	42.2
Ulcerated lesion	22	6.8
White lesion	40	12.4
Red lesion	35	10.8
Limited mouth opening	49	15.2
Dryness of mouth	96	29.7
Burning sensation	22	6.8
Abrasion	140	43.3

Factors associated with smokeless tobacco usage

Table 3: Factors associated with SLT usage

Characteristic variables	User	%	Non uses	%	P-value
Age					144
18 to 28 years	45	31.3	99	68.8	
29 to 39 years	28	41.8	39	58.2	
40years & more	47	47	65	58	
Gender					
Female	39	32.5	106	52.2	.001
Male	81	67.5	97	47.8	
Ethnic groups					
Rajput	33	37.5	55	62.5	
Qureshi	22	46.8	25	53.2	
Sheikh	6	16.5	31	83.8	.041*
Pathan	3	23.1	10	76.9	
Others	36	43.4	47	56.6	
Education Illiterate					
Primary Matric	20	48.8	21	51.2	
More than Matric	59	38.3	95	61.7	.001
	14	18.7	61	81.3	
Oral hygiene					
Good	3	2.5	24	11.9	
Poor	17	14.2	105	52.2	.000*
Very poor	10	83.3	72	35.8	
Use in Friends & family					
Yes	94	78.3	94	46.3	.000*
No	22	18.3	84	41.4	
Don't Know	4	3.3	25	12.3	
Income					
Low	55	44	70	56	
Middle	53	32.1	112	67.9	.071*
High	4	25	12	75	
Marital Status					
Married	43	31.9	92	68.1	
Unmarried	67	40.1	100	59.9	.315*
Widow	9	50	9	50	
Divorced/ separated	1	33.3	2	66.7	
Smoke as well					
No	98	39.2	152	60.8	0.556
Yes	21	43.8	27	56.3	
Systemic Disease					
No	69	31.4	151	68.6	.001
Yes	51	51	27	49	

*Fisher Exact test.

It includes the association with male gender 218(67.5%), lower educational status 157(48.8%) and the history of

usage among friends and family 253(78.3%). However, age, socioeconomic status and marital status were found to be not associated (Table 3).

Usage of smokeless tobacco was found to be strongly associated with poor oral hygiene status 269(83.3%) and systemic disease 164(51%) (Table 3).

Moreover, poor oral hygiene status (OR = 24.24, 95% C.I. 3.12 – 182.7) and history of not brushing teeth (OR = 4.47, C.I. 2.29 – 8.69) were also strongly associated with the presence of oral lesions. A significant association had seen between systemic disease and progression of oral lesions (OR = 2.98, C.I. 1.80 – 4.92). Univariate logistic regression was run to find out the unadjusted Odd Ratios and their 95% confidence interval.

Multivariate logistic regression was run to assess for adjusted Odd ratios of variables which showed a significant association. The final multiple logistic models showed the use of smokeless tobacco (adjusted OR = 30.54, 95% C.I. 11.87 – 78.59), alone was predicting the most, while controlling for the effects of education, oral hygiene status and tooth brushing.

DISCUSSION

Many types of Smokeless tobacco are commonly used. These include paan (betel quid) with or without tobacco, areca nut (chalia), gutka and naswar. Most commonly betel quid with tobacco 108(33.6%) and areca nut 100(31.1%) were used. A similar study has also been conducted in South India in 2013[3]. It also showed the prevalence of use of these products as paan with tobacco 117(36.3%), paan without tobacco 28(8.7%), areca nut 7(2.2%) and gutka 67(20.8%)

This study showed different patterns of consumption of SLT among users. The SLT and areca nut was used most commonly after every meal i.e., 48(41%) per day. While 32(27.4%) were using it one to two times per day, 37(31.7%) were using it 5 or more than 5 times a day. The possible reason for this pattern could be easy availability and affordability and development of addiction. The study conducted in Rawalpindi showed 54 (69%) users who use it for 2 or more than 2 times a day. While the number of respondents taking it after the meals was 65.4%[8].

The present study showed 27(8.4%) respondents with good oral hygiene, 122(38%) with poor and 172(53.6%) with very poor oral hygiene. Along with this, a majority of respondents were having plaque and calculus deposits 276(86%) and 248(77.3%) respectively. Another study conducted in Lahore presented 95% of respondents were having calculus deposits[9].

Significant oral health care among villagers is seen as there were brushing habits along with regular dental check-up. The present study showed 267(84.2%) respondents having brushing habits, while 44(13.9%) respondents don't brush. Moreover, 6(1.9%) respondents brush their teeth with the finger or by other means. Majority of respondents 274(85%) brush their teeth at least once daily, while 1(0.3%) brush after 3 to 7 days. However, 13(4.3%) respondents were presented with irregular brushing habits.

The present study showed the prevalence of oral lesion 31.7%.Theprevalence of white lesions was 12.4%. The result was found to be statistically significant with p value less than 0.05. A study conducted in India showed the prevalence of oral lesions 26.8%, in 2013

The prevalence of red lesion was found to be (10.8%). Red lesion (erythroplakia) appears as a red velvety patch in the oral cavity, hence named as a red lesion. The study conducted in India showed 0.6% of red lesion among users.

The oral cancer patients showed a positive history of use of smokeless tobacco and cigarette smoking and sometimes both, in the past. Among the cancer patients, 37.4% had a habit of SLT use. The smokeless tobacco use had a strong relationship with the development of oropharyngeal cancer as compared to cigarette smoking. As for as the visual inspection of head and neck region is concerned, it should include:

1. Extra-oral examination
2. Intra-oral examination
3. Any tissue swellings, mobility, colour or texture change, asymmetry or tenderness.
4. Visual examination and palpation of the — tongue, floor of the mouth and soft palate complex to identify leukoplakia, erythroplasia, ulceration, induration, fibrotic submucosal bands or any palpable mass.
5. Visual aids

To enhance visualization of premalignant and cancerous lesions, certain diagnostic aids are used, including toluidine blue and fluorescence visualization (the VEL scope)[11].

The topic selected for this study is a vast one. The researcher tried to cover every aspect of the topic but due to the limitation of time and other resources, the research was delimited.

CONCLUSION

Oral lesions are found to be strongly associated with smokeless tobacco and areca nut usage. In this area, the use of a variety of SLT products is on the rise. it should be mandatory to mention the carcinogenic property of the contents of nicotine, tobacco-specific nitrosamines TSNA and areca nut on every commercial SLT product and display the metallic contents and their disease associations e.g.; copper, associated with oral sub-mucous fibrosis. Such information and strong health warnings will highlight its potential risks.

RECOMMENDATIONS

1. There is an urgent need to stop the habit of smokeless tobacco use by Improve literacy amongst people through educational sessions. Experts should give awareness about harmful effects of smokeless tobacco.
2. Current evidence shows that use of smokeless tobacco is not harmless for health. No evidence found that SLT is better than cigarettes, so any claim of the manufacturer should not be allowed.
3. A regulatory authority should check for SLE manufacturing and mention the health warnings like clearly or should mention there is a risk of oral cancer.
4. Manufacturers should satisfy the regulatory authority for SLT product. The product should meet the standards and there is no risk of oral cancer.

5. There is a need of political and public health effort to limit the use of this preventable risk factor.
6. Health ministry, education, commerce, agriculture and tobacco industry should work together to control this spread. There should be a strict ban on advertisement, sponsorship, sale and purchase.
7. The government should impose heavy taxes on all tobacco products.
8. A cancer registry in the nation should also be established to keep a record of diseases. So that incidence, prevalence and burden of disease can be measured.
9. Motivation sessions should be arranged for the people who want to quit the use and also offering them help to quit.
10. Predisposing factors which are responsible for increased use of SLT among children and youth i.e. use in family and friends should be controlled.
11. It is important to take care of mouth and teeth since childhood. If it is not done regularly, one could have problems with one's teeth and gums - like cavities or even tooth loss and diseases of oral tissues.
12. There are certain ways to keep mouth and teeth healthy:
13. Brushing teeth every day with a fluoride toothpaste
14. Use dental floss for interdental area or another type of between-the-teeth cleaner
15. Snack smart - limit sugary snacks
16. Don't smoke or chew tobacco
17. Visit the dentist or oral health professional regularly (NIH, 2015).
18. Dentists can play a vital role in reducing the number of mortality associated with cancer by early diagnosis and motivate patients for regular check-ups. A specific percentage of mortality associated with cancer can also be reduced when detected and diagnosed at earlier stages.

REFERENCES

1. World Health Organization (WHO) report on the global tobacco epidemic, 2015: Raising taxes on tobacco. 2015 Jan 1.
2. Akram, S., Mirza, T., Aamir Mirza, M., & Qureshi, M. (2013). Emerging Patterns in Clinico-pathological spectrum of Oral Cancers. *Pakistan Journal of Medical Sciences*, *29*(3), 783–787.
3. Patil, Bathi & Chaudhari. Prevalence of oral mucosal lesions in dental patients with tobacco smoking, chewing, and mixed habits: A cross-sectional study in South India. J Family Community Med, (2013). Vol. 20(2), page no. 130-135.
4. World Health Organisation (WHO). Media Centre Tobacco Key Facts
5. http://www.who.int/mediacentre/factsheets/fs339/en/ (Visited 20.07.2016)
6. Bhisey, R A. (2013, Feb). Chemistry and toxicology of smokeless tobacco. Indian Journal of Cancer, Volume, 4, Page no.364-372.
7. Patil PB, Bathi R, Chaudhari S. Prevalence of oral mucosal lesions in dental patients with tobacco smoking, chewing, and mixed habits: A cross-sectional study in South India. Journal of Family and Community Medicine. 2013 May 1;20(2):130.
8. Catherine et al. (2006, Jun). Heads Up! — A Call for Dentists to Screen for Oral Cancer. *J Canadian Dental association. Volume, 72, page no. 413- 416.*
9. Abideen ZU, Sabir SA, Zahir J, Hussain T, Fatima H, Farooq H, Elahi A, Abbasi A. The Carcinogenicity of Smokeless Tobacco-Are the Young People Aware. Journal of Rawalpindi Medical College (JRMC). 2013;17(2):265-7.
10. Amjad, Faiza. et al. (2012, Dec). Effects of Tobacco Chewing on Oral Health Status of Patients Visiting University College of Dentistry, Lahore. *Pakistan Oral & Dental Journal. Volume 32, Page no. 489-492.*
11. Rozi, S. & Akhter, S. (2007). Prevalence and Predictors of smokeless Tobacco use among high school males in Karachi, Pakistan. *Eastern Mediteranian Health Journal. Vol. 13, No. 4.page no. 916 – 924.*
12. Catherine F Poh, J Scott Durham, et al. (2011) Canadian Optically-guided approach for Oral Lesions Surgical (COOLS) trial: study protocol for a randomized controlled trial, BioMed Central Ltd, 11:462
13. D. C. Sharma, “Betel quid and areca nut are carcinogenic without tobacco,” The Lancet Oncology, vol. 4, no. 10, p. 587, 2003.
14. Alam AY, Iqbal A, Mohamud KB, Laporte RE, Ahmed A, Nishtar S. Investigating socio-economic-demographic determinants of tobacco use in Rawalpindi, Pakistan. BMC Public Health. 2008 Feb 7;8(1):50.
15. Farooqui A. Indigenous plants: a golden opportunity for discovery. J Infect Developing Countries. 2007;1(2):96-8.
16. Franceschi S, Talamini R, Barra S, Barón AE, Negri E, Bidoli E, Serraino D, La Vecchia C. Smoking and drinking in relation to cancers of the oral cavity, pharynx, larynx, and esophagus in northern Italy. Cancer research. 1990 Oct 15;50(20):6502-7.