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Use of Tobacco and Arecanut, a Risk for Oral Premalignant Disorders in India

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Abstract

Background: According to World Health Organization, of the diagnosed oral cancer worldwide around 40% occur in India, Pakistan, Bangladesh and Sri Lanka.

Methods: 100 Patients of either sex with clinical features suggestive of benign, premalignant intraoral pathologies and fulfilling inclusion and exclusion criteria were taken up for the study. Written informed consent was obtained prior to enrolment into the study.

Results: Tobacco chewing and supari (areca-nut) chewing was significantly higher in premalignant conditions (Leukoplakia) than benign lesions. No significant difference in smoking and alcohol consumption between premalignant conditions and benign lesions.

Conclusion: Tobacco chewing and arecanut (supari) consumption was significantly higher in premalignant lesions than benign lesions.

Keyword: Tobacco, Premalignant Lesions, Benign Lesions.

Introduction: Historically, the definition of an oral premalignant lesion dates back to 1978, when it was defined by the World Health Organization (WHO) as "a morphologically altered tissue in which cancer is more likely to occur than in its apparently normal counterpart."[1]

According to World Health Organization,[2] of the diagnosed oral cancer worldwide around 40% occur in India, Pakistan, Bangladesh and Sri Lanka. India has one of the highest rates in the world; accounting for one-third of the total cancers and unfortunately this figure continues to rise.[3]

A wide array of premalignant conditions has been implicated in the development of oral cancer, including leukoplakia, erythroplakia, palatal lesion of reverse cigar smoking, oral lichen planus, oral submucous fibrosis, discoid lupus erythematosus, and hereditary disorders such as dyskeratosis congenital and epidermolysis bullosa.[4]

Tobacco has traditionally been chewed in India as an ingredient of betel quid or pan, which is a combination of betel leaf, areca nut, and lime, although in recent time an increase in consumption of other forms, such as gutka, khaini, mawa, and so on, has been on the rise. [5]

Use of various products, blends such as panmasala, gutkha is increasing not only among men but also among children, teenagers and women in India and other south-east Asian countries which has also been associated with increased risk.

Smoking in the form of cigarettes is usually restricted to the urban population and higher socioeconomic strata while in rural areas and low socioeconomic groups tobacco is smoked mostly in the form of bidi and chilam.[5] Tobacco contains numerous carcinogens, including polonium 210, tobacco-specific *N*-nitrosamines, volatile aldehydes, and polycyclic aromatic hydrocarbons.[6]

Betel nut chewing is considered the fourth most commonly used addictive substance in the world after tobacco, alcohol, and caffeine.[7]Chewing typically initiates in youth or early adulthood and progresses to habitual, regular betel nut use which continues over many years.[8]

Micronutrient deficiencies[9,10] *and* poor oral hygiene[11] has also been associated with increased risk.

Many epidemiological studies conducted over the last three decades in America, Europe, and Asia have provided strong evidence of an association between alcohol and tobacco use and an increased risk of oral and pharyngeal tumors.[12]

Low socio-economic status is as well significantly associated with increased oral cancer risk in high and lower income-countries, across the world.[2]

Materials And Methodology

Source of data: Patients with clinical features suggestive of benign, premalignant intraoral pathologies who attend ENT OPD at Sardar Patel Medical College and Hospital, Bikaner

Study period: January 2017 to December 2018

Sample size: 100 cases

Inclusion criteria: Patients with clinical features suggestive of benign, premalignant intraoral pathologies of 18-75 years age group, and both sex

Exclusion criteria

- Malignant intraoral pathologies
- Pregnant Female
- Patient who do not give written informed consent

Method of collection of data

100 Patients of either sex with clinical features suggestive of benign, premalignant intraoral pathologies and fulfilling inclusion and exclusion criteria were taken up for the study. Written informed consent was obtained prior to enrolment into the study. Detailed evaluation of the patient was done including detailed history, height and weight, smoking, tobacco and alcohol use, arecanut use, duration and frequency of consumption and complete ENT examination with neck examination and relevant investigations.

Statistical Analysis

All data were analyzed on EPI-info statistical software.

- Qualitative data was expressed in the form of proportion.
- Quantitative data was expressed in Mean ± SD
- Qualitative data was compared by Chi square test
- Unpaired t test was used to infer the difference in means.

Results

Table no 1. Site wise distribution

Site	No of cases	Percentage
Buccal mucosa	37	37.00
Tongue	26	26.00
Floor of mouth	7	7.00
Hard palate	4	4.00
Lip	15	15.00
Gingivobuccal Sulcus	5	5.00
Alveolar ridge	6	6.00
Total	100.00	100.00

Table no 1 shows that maximum number (37.00%) of cases were present on buccal mucosa followed by 26.00% cases present on tongue, 15% cases were present on lip,

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7% cases on floor of mouth, 6% cases were present on alveolar ridge, 5 % on gingivobuccal sulcus and 4.00% cases were present on hard palate.

Table no 2. Habit wise distribution

Type of Habit		Premalignant (n=33)	Benign (n=67)	Total	p-value
Tobacco	< 5 Year	0	6	34	0.027
	5-10 Year	2	5		
	>10 Year	19	2		
Smoking	< 5 Year	2	10	45	0.123
	5-10 Year	9	9		
	>10 Year	10	5		
Alcohol	< 5 Year	2	5	24	0.324
	5-10 Year	4	4		
	>10 Year	4	5		
Supari	< 5 Year	1	3	44	0.023
	5-10 Year	8	2		
	>10 Year	14	6		

Table no 2 shows that tobacco chewing and supari (areca-nut) chewing was significantly higher in premalignant conditions (Leukoplakia) than benign lesions. No significant difference in smoking and alcohol consumption between premalignant conditions and benign lesions. The association between duration of tobacco chewing & supari and oral condition was found stastically significant.

Discussion

The use of tobacco in various forms is widespread in India, with between 47% and 73% of population indulging in the habit, compared with approximately 36% in United States. The rate of transformation of precancerous lesions into oral cancers is similar to that seen elsewhere, suggests that the high incidence of oral cancer in India is not a reflection of a unique susceptibility but simply of the very high prevalence of tobacco use.[13]

In our study tobacco chewing and areca-nut use was significantly higher in patients with premalignant conditions than benign lesions. In premalignant conditions 63.6 % patients were tobacco chewers and 69.7 % patients consumed areca-nut(supari). The association between duration of tobacco chewing & supari and oral condition was found stastically significant.

Even smoking and alcohol consumption was higher in patients with premalignant lesions (smoking-63.6%, alcohol-30.%) when compared to those with benign lesions but difference was not statistically significant.

C-H Lee et al showed that nonsmokers and nondrinkers who chewed betel quid had, respectively, a 10.0 –15.6 and 26.5 –39.3-fold significant risk of Oral leukoplakia and Oral submucous fibrosis, and both risks were lower than that reported for tobacco contained areca nut products (Odd's Ratio: 17.4 and 44.1 for Leukoplakia and Oral submucous fibrosis, respectively)[14]. The difference in risks between areca nut with and without tobacco implies that tobacco could have an additional effect on these premalignant conditions.[15]

The carcinogenicity of tobacco is well documented but the individuals consuming areca nut compounds (gutka) were predisposed to oral premalignant lesions early compared to tobacco chewers. These lesions were found significantly associated with the duration and frequency of consumption. [16]

Aruna Tambuwala et al [17]also observed that in premalignant conditions 68 % patients were cigarette smokers over more than 5 years duration and 88 % were tobacco chewers.

Lopez-Jornet P et al[18] in his study observed that 81.3% of patients with leukoplakia were cigarette smokers. Alcohol consumption (1 or 2 units per day) was recorded in 35.4%, while 64.6% patients reported no alcohol intake.

Most common site of premalignant lesions in our study was buccal mucosa. It can be attributed to the habit of

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keeping tobacco and arecanut between cheek and gingiva after it is chewed.[19]

Conclusion

Tobacco chewing and arecanut (supari) consumption was significantly higher in premalignant lesions than benign lesions. Areca nut has a long history of use in socio-cultural and religious activities in India. Gutka (Areca nut with tobacco) is a commercially powdered mixture containing chemical carcinogenic compounds. Regular use of these, both independently & synergistically leads to oral premalignant disorders which have propensity of malignant transformation**.**

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