Comparative study on the prevalence of oral cancer between patients who consume tobacco and paan

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Abstract

Aim: To compare the prevalence of oral cancer between patients who consume tobacco and paan

Objective: The objective of the research work is to compare the prevalence of oral cancer between patientswhom consume tobacco and paan.

Background: The increasing usage of paan, a mixture of tobacco and betel leaf seems to be associated with anonset of oral sub mucous fibrosis which can be potentially malignant in development of squamous cell carcinoma

Reason: The study will reveal how commonly the oral cancer will develop in a tobacco and paan chewing patient.

Introduction

Tobacco use is one of the most important risk factors for the development of oral mucosal lesions including oral pre-cancer and cancer.[1]Smokeless tobacco' includes various forms of tobacco which "Paan" being the most common one used.[2]. Paan consists of a number of ingredients, including tobacco, areca nut, slaked lime, and spices and introduced in India nearly three decades ago. In recent years, various commercial preparations known as *pan masala* and*gutkha* have become available in India and in many parts of Asia. Many brands of these products contain areca nut and tobacco, both of which have been implicated in occurrence of oral cancer. The investigators have also observed that smoking and chewing of tobacco and betel quid act synergistically in oral carcinogenesis and that persons with mixed habits form a substantially high-risk population..[3]It's said that betel quid and chewable tobacco is the fourth most commonly used psycho-active substance in the world, ranking after caffeine, alcohol and nicotine .[4-6].

In comparison to western populations, in which oral cancer represents about 3% of malignancies, it accounts for over 30% of all cancers in India; this difference can be attributed to regional variation in the prevalence and pattern of habits.[5] However, epidemiological data of the changing trends are lacking. The purpose of this study was to investigate the prevalence of oral mucosal changes in individuals with smoking, chewing, and mixed habits and to assess the relative risk of oral lesions resulting from the habits.

Smokeless tobacco users in India and Pakistan together have been estimated to number 100 million.[6-9]. In India about 35–40% of tobacco consumption is in smokeless forms while an earlier study in Pakistan showed that 21% of men and 12% of women were users of betel quid.[10]. In Pakistan, a recent study among the adolescents and adults of a Karachi squatter settlement reported that 40% of the population was using at least one chewable product of betel, areca and tobacco on a daily basis .[11].

Chewing betel, areca and oral tobacco products lead to discoloration of teeth, development of chronic debilitating diseases involving gingival and oral mucosa, and higher mortality among users. These diseases include oral sub mucous fibrosis, oral leukoplakia, oral cavity and other head and neck cancers [12]. There is also evidence that oral tobacco is a risk factor for hypertension and dyslipidemia.[13-15]. Chewing of tobacco by pregnant mothers has been found to cause an increased incidence of still births and low birth weight deliveries [3]. In addition, chewing of betel quid, with or without tobacco can aggravate asthma and predispose the users to diabetes mellitus.[16]. Regular use of Paan and gutka leads to oral cancer and precancerous conditions.[2-6]

Materials and Methods

This study was conducted among 50 subjects in Saveetha Dental College and Hospital. The subjects were patients who have visited the hospital for dental treatment and have a history of tobacco usage as well as showing precancer or cancer characteristics. The patients were given a questionnaire that comprises of questions regarding age, sex, religion, place of residence, literacy level as well as tobacco habits such as type of tobacco used as well as duration of usage of the tobacco. The results were tabulated into a table on the types of malignancy found in the patient's oral cavity.

Questionnaire

1. Age: 18-25/ 26-33/ 34-41/42-49/50-57/ 58- 65/ 66- 73 (specific age:)

2. Sex: Male/ Female

3. Place of residence: Urban/ Rural

4. Literacy level: Literate/ Illiterate

5. Type of tobacco used: Tobacco/ Paan Masala/ Mixed

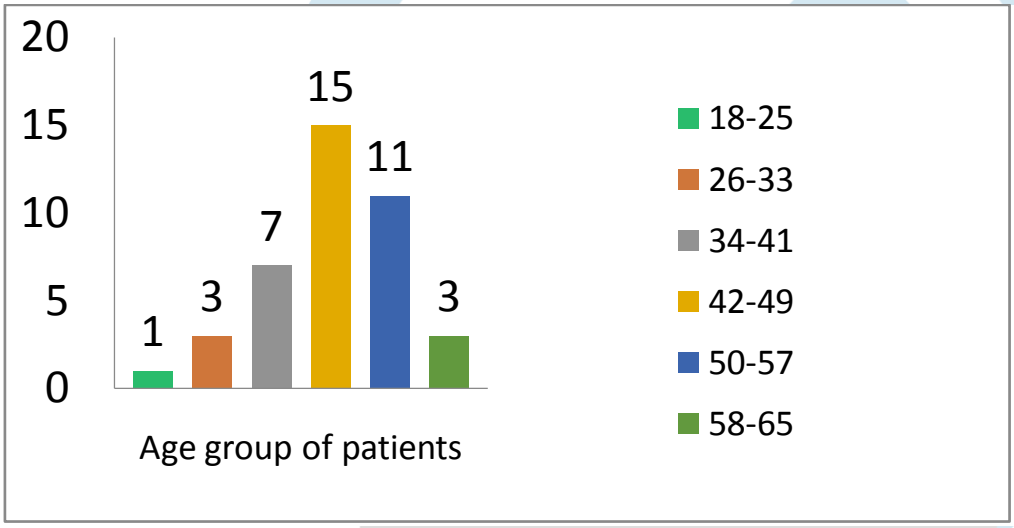
6. Duration of tobacco usage in years: 0-10/11-20/21-30/31-40

7. Frequency in a day: 1-5/ 6-10/ 11-15/ 16-20

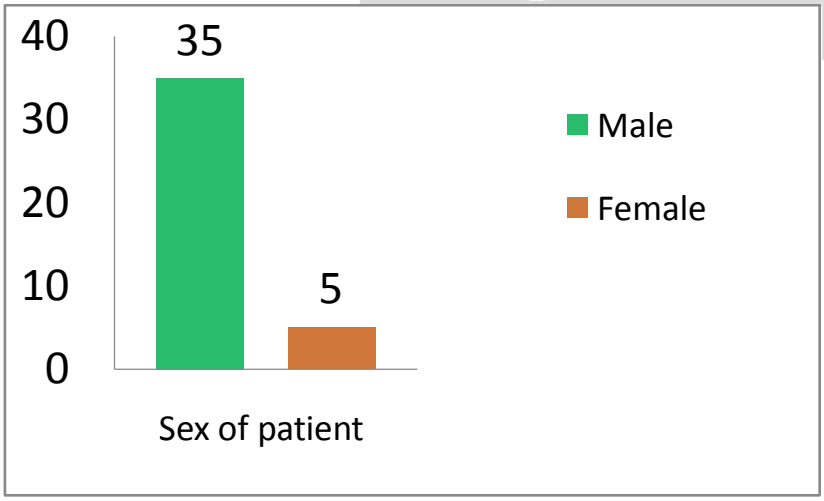
8. Prevalence of cancer: OSF/ Oral Cancer/ Leukoplakia/ Lichen Planus

Results

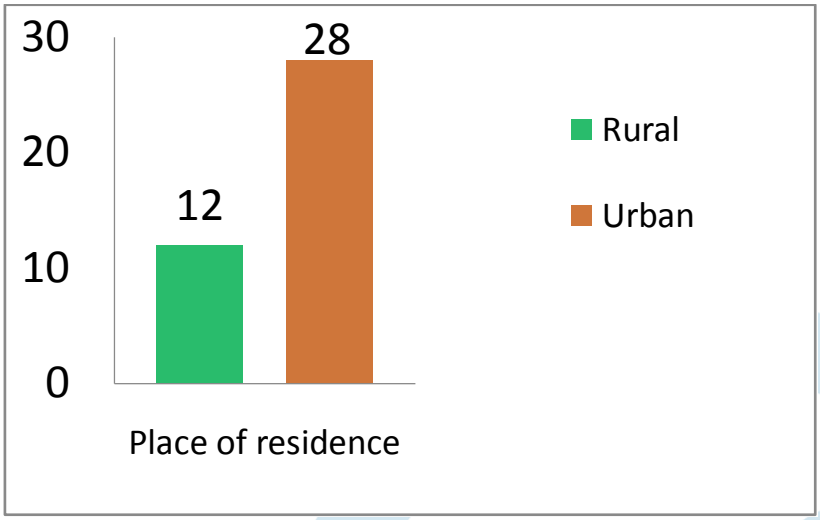
A patient population of 40 participated in the study of which the average age of the study group was 48.3 years with 23 years and 60 years of age being the youngest and oldest patients. Most of the patients are in the 42-49 age group



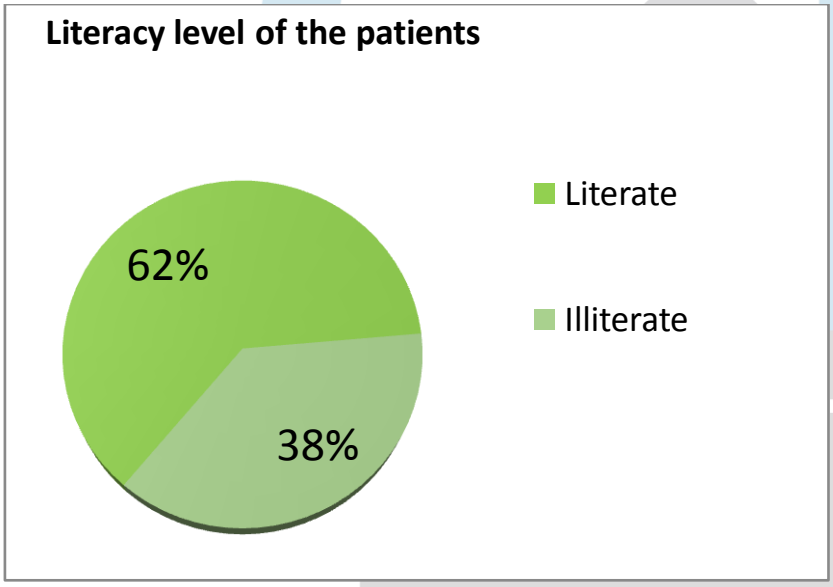
35 were males and 5 were females which corresponds to 87.5 % of the study population as males and 12.5 % as females in the group of 40 patients tested.



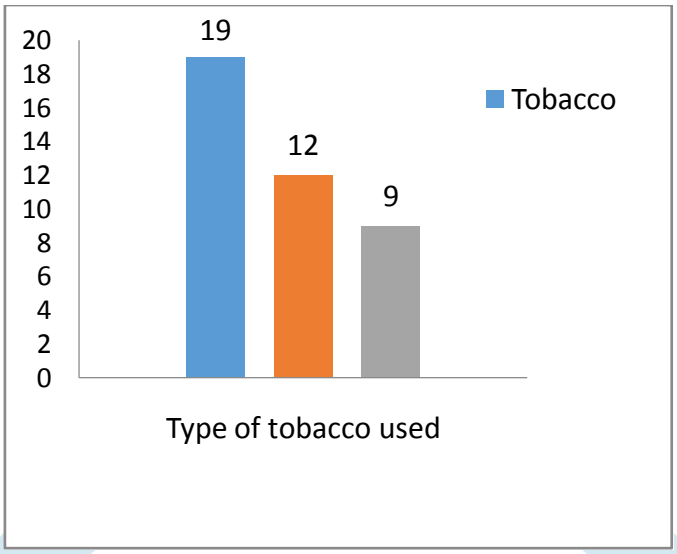
When asked about the place of residence of the patients, 28 of the 40 patients which makes up 70% are from the urban area while the other 12 of the 40 patients which makes up of 30% are from the rural area



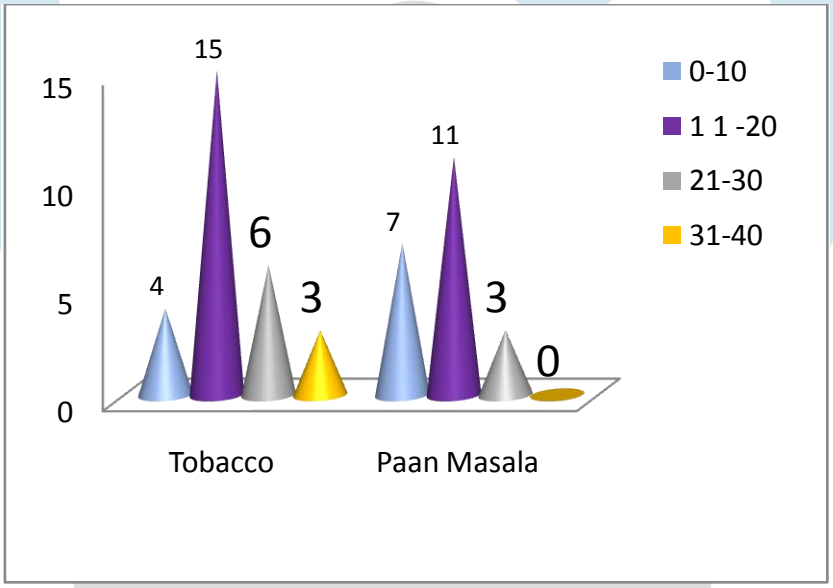
The literacy level among the 40 patients are divided into literate and illiterate 62% of them are literate which makes up for 25 out of the 40 patients whereas 38% of them are illiterate which makes up for 15 out of the 40 patients.



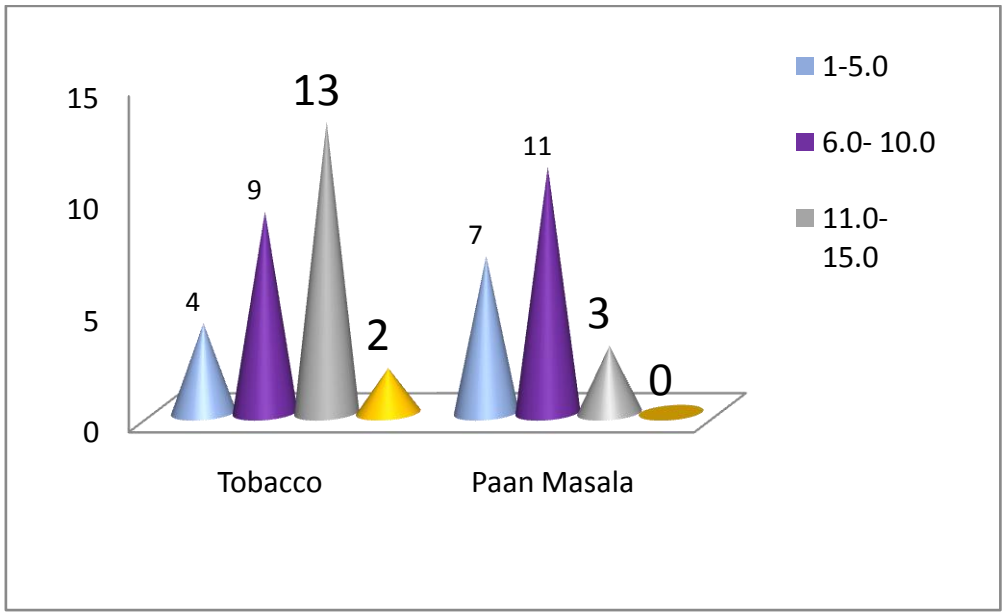
Type of tobacco used by patients were asked and the response were as follows, 19 patients use tobacco, 12 of the patients were found to have preferred paan masala while the remaining 9 patients chew paan masala as well as smoke tobacco.



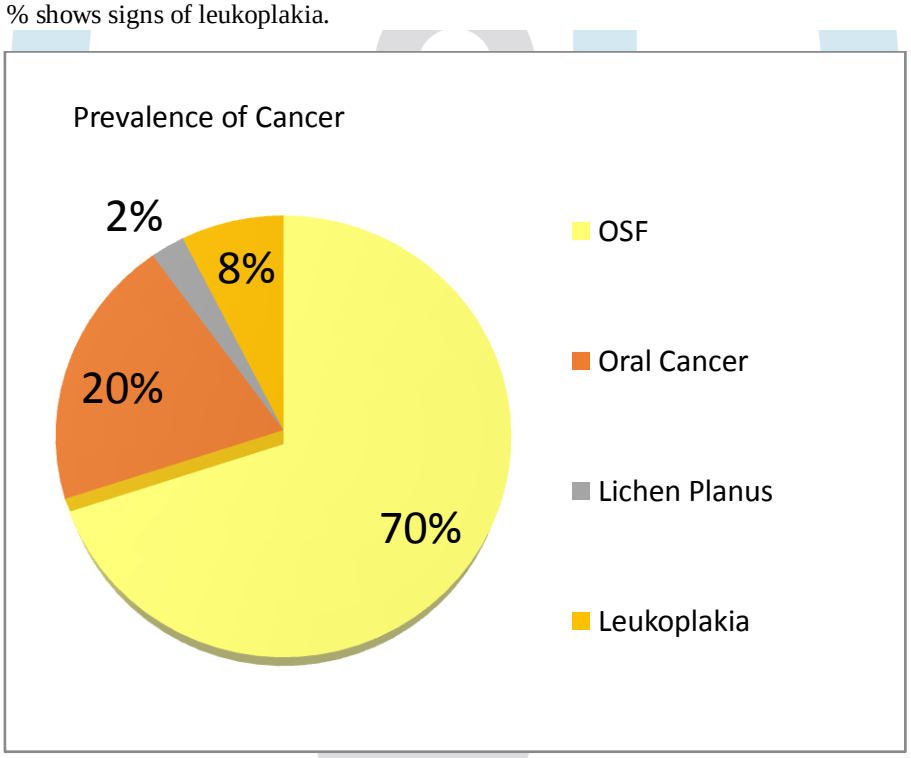
A patient population of 40 participated in the study of which the duration of tobacco in years were asked and the average duration was 18.3 years with 7 years being the fewest and 36 years being the oldest for tobacco smoking whereas for paan masala chewing the average age of the study group is 12.6 years with 3 years being the fewest and 25 years being the longest.



When the group of 40 people were asked about the usage frequency in a day, the answer was an average of 13.2 tobacco smoked a day with 8 being the fewest and 25 being the most. When it came down to paan masala, the average of paan masala chewed was 6.4 times with 3 times being the least and 9 times being the most.



Out of the 40 patients, 70% or 28 out of the 40 patients shows signs of OSF, 8 of the 40 patients shows symptoms of Oral Cancer which makes up to 20%, 1 patient showed symptoms of Lichen Planus which are presented in only 2.5 %, 3 of the 40 patients which makes up to 7.5 % shows signs of leukoplakia.



Discussion

The habit posed the maximum risk for OSF, which justifies the highest prevalence of OSF in this region of the country. The risk was an interplay of habit duration and intensity. These habits are very addicting and the users often continue chewing tobacco/*pan masala* over several years. The length of chewing duration also increases the number of times one chews. There are users in this part of the country who chew tobacco/pan masala continuously during waking hours. The use of smokeless tobacco (*Pan Parag*, *zarda*, etc.) is on the rise. Considering the impact of habit duration and intensity, it is not surprising to see a high incidence of oral cancer and OSF in this region.[17]

In a nutshell, our results show that the habit of chewing tobacco/*pan masala* is a very strong risk factor for oral cancer and related lesions. It is not only the duration for which one had been consuming, the number of times one consumes everyday is also strongly related with oral cancer and related lesions. It maybe merely a false impression that educated people chew less and are at a lesser risk. The percentage of chewers does not differ much between illiterates and literates, and the habit was less of a risk

factor in the rural or economically poor people. A very strong correlation of tobacco/*pan masala* chewing with OSF explains a very high incidence of this precancerous lesion in this part of the country. A more serious threat is the introduction of several new mixtures of chewing tobacco/*pan masala* which are increasing by the day. Often, these mixtures have more than one kind of hazardous content mixed in them, which may result in the exposure to several different toxic substances at the same time, making it the most dangerous form of the habit. We need to review the policies governing the contents, sale, and use of these mixtures, and to educate the educated and uneducated people about the hazardous effects these habits may have.

Smoking in general, appears to increase the risk of oral cancer, but similar to other studies in India,[16] no association was found between filtered cigarette smoking and the risk of oral cancer **.** An increased risk of oral cancer amongst *bidi* smokers was observed compared to never bidi smokers, which corroborated the finding of earlier studies. [19-20] It is possible because, firstly, the most prevalence type of smoking in the population was *bidi*. Secondly, it might also indicate the qualitative difference between *bidi* and cigarette smoking, due to the additional burning of the dried temburi leaf. Moreover, in India, bidi smoking being affordable to mass of population, is most common than cigarette smoking. These aspects may explain bidi being a factor for an increased risk of oral cancer in India.

In this study, no significant effect of betel quid was seen in association with oral cancer. It may be explained by the protective effects of betel leaf, main ingredient of betel quid, to the oral mucosa against the harmful alkaloids present in the areca nut in betel quid chewers, because betel leaf is known to be rich in beta-carotene, which have the capacity to quench free radicals that are toxic. [21]

Tobacco was more common among the male gender is in line with what was found by Imam et al (5) and Mazahir et al (6). We feel this is because the use of tobacco (smoke and or chewable) remains socially more acceptable for males than females. On univariate analysis, we found an association between native students and using smokeless tobacco and multivariate analysis showed that this was an independent association. In the other hand, common use of smokeless tobacco in native people in boundary states widely spreads among educated classes.

Conclusion

Oral malignancies continue to burden the clinical and economic dimensions of health care around the world. The Indian subcontinent accounts for one-third of the world burden.

Based on the study conducted, it could be seen that chewing paan masala causes prevalences of cancer faster than smoking tobacco. Besides, chewing paan also causes more dental related ailments compared to smoking. Although both are negative in effects, paan masala is more dangerous and has a higher prevalence of causing cancer than tobacco smoking.

Use of tobacco use and alcohol are known risk factors for cancers of the oral cavity. In India, 57% of all men and 11% of women between 15 and 49 years of age use some form of tobacco. About 800,000 deaths occur every year in India directly as a result of cardiovascular diseases, chronic obstructive lung diseases, and tobacco-related cancers.[22] If current smoking patterns persist, tobacco is set to cause about one-third of all deaths. Use of tobacco continues to have a personal impact on individuals as well as having an impact on public health. Hence, the reason that cancers of the oral cavity occupy a strategic position in the health-care systems is that an early detection of these lesions is theoretically possible and practically useful. Such early detection is generally associated with a high expectation of the prevention of deformity, relapse, and mortality.

References

1. Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. Respirology. 2003;8:419–31.[PubMed]

2. Hamada GS, Bos AJ, Kasuga H, Hirayama T. Comparative epidemiology of oral cancer in Brazil and India. Tokai J ExpClin Med. 1991;16:63–72. [PubMed]

3. Khandekar SP, Bagdey PS, Tiwari RR. Oral Cancer and Some Epidemiological Factors: A Hospital Based Study. Ind J Comm Med. 2006;31:157–9.

4. Hebert JR, Gupta PC, Bhonsle RB, Mehta H, Zheng W, Sanderson M, et al. Dietary exposures and oral precancerous lesions in Srikakulam District, Andhra Pradesh, India. Public Health Nutr. 2002;5:303–12.[PubMed]

5. Murti PR, Bhonsle RB, Pindborg JJ, Daftary DK, Gupta PC, Mehta FS. Malignant transformation rate in oral submucous fibrosis over a 17 year period. Community Dent Oral Epidemiol. 1985;13:340–1. [PubMed]

6. Pindborg JJ, Murti PR, Bhonsle RB, Gupta PC, Daftary DK, Mehta FS. Oral submucous fibrosis as a precancerous condition. Scand J Dent Res. 1984;92:224–9. [PubMed]

7. Mehta FS, Gupta PC, Daftary DK, Pindborg JJ, Choksi SK. An epidemiological study of oral cancer and precancerous condition among 101,761 villagers in Maharashtra, India. Int J Cancer. 1972;10:134–41.[PubMed]

8. Bhowate RR, Rao SP, Hariharan KK, Chinchkhede DH, Bharambe MS. New Delhi: Allied Publishers Limited; 1994. Oral mucosal lesions among tobacco chewers: A community based study. Preventive section in XVI International Cancer Congress, Abstract Book-1; p. 435.

9. Maher R, Lee AJ, Warnakulasuriya KA, Lewis JA, Johnson NW. Role of areca nut in the causation of oral submucous fibrosis: A case-control study in Pakistan. J Oral Pathol Med. 1994;23:65–9. [PubMed]

10. Mani NJ. Preliminary report on prevalence of oral cancer and precancerous lesions among dental patients in Saudi Arabia. Commun Dent Oral Epidemiol. 1985;13:247–8. [PubMed]

11.Warnakulasuriya KAAS, Trivedy C, Maher R. Etiology of oral submucous fibrosis. Oral Disease. 1997;3:286–287.

12.Warnakulasuriya KAAS, Johnson NW. Epidemiology and risk factors for oral cancer: Rising trends in Europe and possible effects of migration. International Dental Journal. 1996;46:245–250.

13.Croucher R& Choudhury SR. Tobacco control policy initiatives and UK resident Bangladeshi male smokers: communitybased, qualitative study. Ethnic Health. 2007;2:321-337.

14.Mahmood Z. Smoking and chewing habits of people of Karachi–1981. Journal of Pakistan Medical Association. 1982;32:34–37.

15.Khawaja MR, Mazahir S, Majeed A, et al. Chewing of betel, areca and tobacco: perceptions and knowledge regarding their role in head and neck cancers in an urban squatter settlement in Pakistan. Asian Pacific Journal of Cancer Prevention. 2006;7:95-100.

16.Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. Respirology. 2003;8:419–431.

17.Nishtar, S, Ahmed A, Bhurgri Y, Mohamud KB, Zoka N, Sultan F. Prevention and control of cancers: National Action Plan for NCD Prevention, Control and Health Promotion in Pakistan. Journal of Pakistan Medical Association. 2004;54:45–56.

18.Tsai JF, Chuang LY, Jeng JE. Betel quid chewing as a risk factor for hepatocellular carcinoma: a case-control study. British Journal of Cancer. 2000;84:709–712.

19.Bhurgri Y, Bhurgri A, Hussainy AS. Cancer of the Oral Cavity and Pharynx in Karachi – Identification of Potential Risk Factors. Asian Pacific Journal of Cancer Prevention. 2003;4:125–130.

20.Babu S, Bhat R, Kuma PU. A comparative clinico-pathological study of oral submucous fibrosis in habitual chewers of pan masala and betelquid. Journal of Toxicology and Clinical Toxicology. 1996;34:317–322.

21. Axell T, Zain RB, Siwamogstham P, Tantiniran D, Thampipit J. Prevalence of oral soft tissue lesions in out-patients at two Malaysian and Thai dental schools. Commun Dent Oral Epidemiol. 1990;18:95–9.[PubMed]

22. Reichart PA, Mohr U, Srisuwan S, Geerlings H, Theetranont C, Kangwanpong T. Precancerous and other oral mucosal lesions related to chewing, smoking and drinking habits in Thailand. Commun Dent Oral Epidemiol. 1987;15:152–60. [PubMed]