Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 12, pp.43012-43015, December, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

PREVALENCE OF DENTAL CARIES AMONG SMOKELESS TOBACCO CHEWERS IN DAKSHINA KANNADA DISTRICT POPULATION: A CROSS SECTIONAL STUDY

Dr. Krishna Prasada Lashkari and *Dr. Alka Shukla

Department of Conservative Dentistry and Endodontics, KVG Dental College and Hospital, Sullia

ARTICLE INFO

Article History:
Received 03rd September, 2016
Received in revised form
17th October, 2016
Accepted 17th November, 2016
Published online 30th December, 2016

Key words:

Smokeless Tobacco,
Dental caries,
Gutka,
DMFT index.

ABSTRACT

Aim: The purpose of this study was to assess association between smokeless tobacco consumption and prevalence of dental caries in Dakshina Kannada population.

Materials & Methods: In this study 172 elderly dentate and consenting individuals (79 females, 93 males) were included. Patients were subjected to clinical examination under natural light with the aid of mouth mirror, No. 23 explorer and cotton rolls. Age of study group ranged from 20 years to 65 years. Tobacco consumption habit data were collected through validated questionnaire. DMFT (Decayed, Missing, and Filled Teeth Index-WHO modification 1987) was used to assess caries experience of study group.

Results: Mean DMFT score of smokeless tobacco chewers was 5.66 ± 1.55 and of non-tobacco chewers it was 3.99±1.6 which showed significant association between smokeless tobacco consumption and dental caries experience in Dakshina Kannada population (p= 0.001). Among various forms of smokeless tobacco, tobacco along with paan leaves was the most adopted one (15.1%); but the highest mean DMFT score being 6.00±1.26 was observed in patients who consumed gutka.

Conclusion: This study throws light on possible contribution of smokeless tobacco consumption towards increased caries experience and it also reflects potential role of form of smokeless tobacco consumption towards dental caries.

Citation: Krishna Prasada Lashkari and Alka Shukla, 2016. "Prevalence of dental caries among smokeless tobacco chewers in dakshina kannada district population: A cross sectional study", *International Journal of Current Research,* 8, (12), 43012-43015.

INTRODUCTION

Tobacco chewing has been practiced among people in many Asian countries including rural areas of India for quite a long time (Gauravi A. Mishra *et al*., 2012). Tobacco is an agricultural product of the leaves of plants in the genus "Nicotiana". It is primarily derived from species "Nicotianatabacum". It is being consumed in various forms including cigarettes, cigars, pipe tobacco, and smokeless tobaccos (chewing tobacco, gutka and snuff) (Winn, 2001). Available evidence suggests that the risks of oral diseases increase with greater use of tobacco. There is strong evidence that tobacco usage has numerous negative effects on oral health, for example, staining of teeth and dental restorations, reduction of the ability to smell and taste, coated tongue, oral cancer, oral mucosal lesions, periodontal disease, gingival recession, implant failure and coronal and root caries (Winn, 2001; Reibel, 2003). Smokeless tobacco (ST) has fermentable sugars and nicotine as one of the main constituents (Vellappally *et al*., 2007; Hellqvist *et al*., 2012). As caries is a multi-factorial disease with clear life-style, socio-economic and socio-demographic gradients, the tobacco use may have a role in this complex rather than a direct etiological factor (Hanioka *et al*., 2011; Cinar and Christensen, 2011). The supreme aim of this study was to unfold the relationship between Smokeless Tobacco (ST) usage and prevalence of dental caries in Dakshina Kannada population.

MATERIALS AND METHODS

The study included 172 elderly dentate and consenting individuals (79 females, 93 males) who had attended screening dental camps conducted by KVG Dental College & Hospital Sullia, South Karnataka, India. Patients were subjected to clinical examination under natural light with the aid of mouth mirror, No. 23 explorer and cotton rolls. Age of study group ranged from 20 years to 65 years. Demographic, tobacco consumption habit and health behaviour data were collected through personal interviews using a structured and validated questionnaire. The subjects were examined by post-graduate students of Dept. of Endodontic and Conservative Dentistry. DMFT Index (WHO modification 1987) was used to assess caries experience of study group (Peter, 2009).

Corresponding author: Dr. Alka Shukla,
Department of Conservative Dentistry and Endodontics, KVG Dental College and Hospital, Sullia

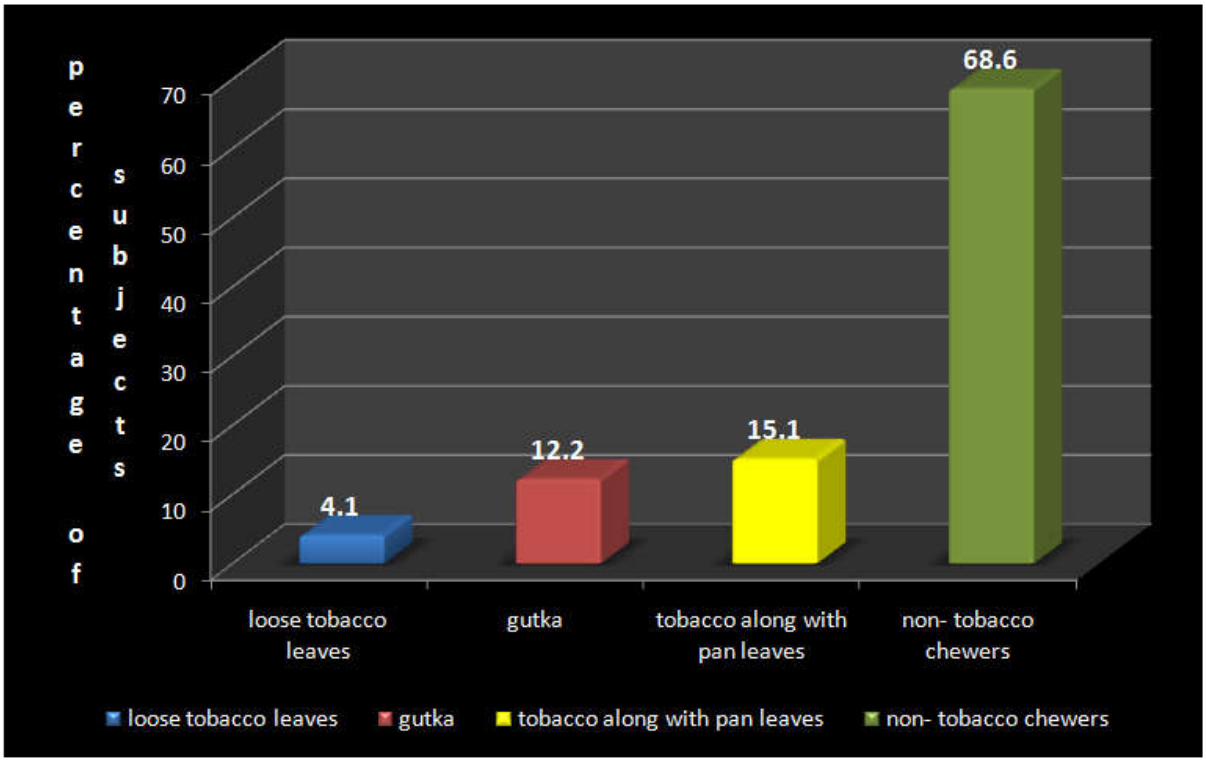

Fig. 1. Three form of smokeless tobacco were frequently consumed. Out of 34.1%, 15.1% of subjects consumed Tobacco along with Paan leaves, 12.2% consumed Gutka and 4.1% consumed loose tobacco leaves

The following criteria were used to diagnose decayed tooth: catch with explorer, discontinuity of enamel surface, definite cavitation and soft base. Subjects who were exclusively smokers were excluded from the study. The data were entered into Microsoft excel sheet and analysed using SPSS version 21. Descriptive statistics were computed including mean and Standard Deviation, Chi square statistics was used to analyse association.

RESULTS

In this study 172 people were examined, out of which 54.1% were males and rest 45.9% were females (Table 1). Mean age of study group was 41.38± 7.50 years. The overall prevalence of smokeless tobacco usage was 31.4% (Table 1). There were three forms of Smokeless Tobacco (ST) which were frequently consumed: tobacco along with paan leaves, dried tobacco leaves and gutka. Among 34.1% of ST consumers, 15.1% consumed tobacco along with paan leaves, 4.1% consumeddried tobacco leaves, and 12.2 % consumed gutka (Fig. 1). The mean DMFT score of ST chewers was found to be higher when compared to that of non-ST chewers (Table 2). Among three various forms of ST, gutka chewers presented with highest DMFT score i.e., 6.00±1.26, followed by tobacco along with paan leaves chewers i.e., 5.61±1.6and driedtobacco leave chewers i.e., 4.85±2.03 (Table 3). There was statistical association between smokeless tobacco consumption and DMFT scores (p=0.001). Also, there was significant correlation between form of tobacco and DMFT scores (p=0.001) (Table 4). Highest DMFT score were observed in subjects who consumed gutka, followed by tobacco along with paan leaves chewers and the least DMFT scores were observed in dried loose tobacco leaves chewers.

Table 1. Distribution of study participants according to gender and habits

	Frequency n(%)
Gender (N=172)	
Males	93(54.1)
Female	79(54.1)
Habit	54 (31.4)
ST-chewers	118 (68.6)
Non ST-chewers	

Table 2. DMFT scores of tobacco chewers & non-tobacco chewers

Groups	Mean DMFT score
ST chewers	5.66±1.55
Non- ST chewers	3.99±1.6

Table 3. DMFT scores of different form of ST chewers

Form of ST	DMFT score
Paan leaves and tobacco	5.61±1.6
Gutka	6.00±1.26
Dried tobacco leaves	4.85±2.03

Table 4. Association of DMFT with tobacco habit and forms of smokeless tobacco

	Chi-Square	*p*
Tobacco habit	66.13	0.001
Form of smokeless tobacco	90.29	0.001

DISCUSSION

India is the second largest consumer of tobacco globally. The tobacco problem in India is peculiar, with consumption of variety of smokeless and smoking forms (Gauravi A. Mishra *et*

al., 2012). The estimates of the Global Adult Tobacco Survey (GATS) conducted among persons 15 years of age or older during 2009–10 indicated that 34.6% of the adults were tobacco users. Majority of them were smokeless tobacco consumers (Global Adult Tobacco Survey (GATS) India: 2009-2010). According to the global adult tobacco survey India, in Karnataka 28.2% of adults (15 years and above) used tobacco (Global Adult Tobacco Survey (GATS) India: 2009-2010). Our study which was conducted in Dakshina Kannada revealed that around 34.1 % of study population consumed smokeless tobacco. Tobacco consumption is obliged to cause a variety of detrimental effects on human body. In addition to its established role as a carcinogen, chewing tobacco may be a risk factor in the development of root-surface caries and, to a lesser extent, coronal caries (Tomar and Winn, 1999; Holmén *et al*., 2013; Ainamo, 1971). In our study, it was found that ST consumers showed higher DMFT index when compared to non-ST consumers which is in agreement with study conducted by Vellappally *et al* in 2007.Vellappally *et al*. reported that mean number of decayed teeth was highest in tobacco chewers followed by regular smokers and ex-smokers (Vellappally *et al*., 2007). Studies have revealed that natural form of tobacco contains sugars in it. In natural tobacco, sugar can be present in a level up to 20% by weight (wt). Hellqvist L*et al* in their study demonstrated that the nicotine-containing tobacco products contained traces of glucose, fructose and sucrose (0.5-1%) and starch (approximately 1.5%) (Hellqvist *et al*., 2012). In addition, various sugars and sweeteners are added intentionally during tobacco manufacturing process to mask the bitter taste of it (Hsu *et al*., 1980). This range of sugar and sweetener can vary from 4%wt to 13%wt. Along with sweeteners; tobacco products have few additives which contain high amount of sugars, for example, fruit juices, honey, molasses extracts, cones and maple syrup and caramel. These agents can also be considered as one of the contributing factors towards increased dental caries incidence among ST chewers.

Large variations in sugar levels in tobacco products can exist within form-to-form, store-to-store, brand-to-brand, and state-to-state. This may explain the diverse opinions of dental practitioners and investigators with respect to the concept of tobacco increasing or decreasing incidence of dental caries (Going *et al*., 1980). Generally, non-smoking form of tobacco are mostly related to promotion of dental caries.

Major biological effects of smokeless tobacco related to dental caries:

- High levels of fermentable sugar and sweeteners in ST can stimulate growth of cariogenic bacteria.
- Extracts from chewing tobacco with high sugar content increased in vitro growth of Lactobacillus casei.
- Extracts of ST may serve as a growth substrate for microbes which are frequently associated with human dental caries i.e., Streptococcus mutans, Streptococcus salivarius and Streptococcus sanguis (Vellappally *et al*., 2007).

Along with above mentioned factors, nicotine which is one of the components of tobacco has also been found to contribute towards dental caries (Huang *et al*., 2015). Huang R *et al* in an in vitro study demonstrated that nicotine enhanced biofilm formation and biofilm metabolism of Streptococcusmutans, and therefore nicotine may be one of the contributors of caries development (Huang *et al*., 2012). Other reason which can help to explain association between ST and Dental caries is gingival recession that is caused by tobacco chewing. Gingival recession often leads to exposure of root surfaces and thus makes it vulnerable to dental caries attack. In USA, a dose-dependent association was found between tobacco chewing and root-surface caries therefore there are very high chances that caries observed in ST chewers might be more of root caries (Tomar and Winn, 1999). Results of this study have also revealed that mean DMFT scores of people who consumed tobacco along with paan leaves or only dried tobacco leaves were lesser when compared to DMFT score of population who consumed gutka. This finding can be attributed to presence of anticariogenic etherical oils or substances in the betel leaf (Moller *et al*., 1977). This study was an attempt to assess the relationship between ST consumption and dental caries. Though the results of this study are inclined in favour of ST as a potential risk factor for dental caries, there are certain studies which contradict it. Bhatt *et al* in their study showed that ST extracts showed anti-microbial activity against Candida, Actinomyces and Lactobacilli species suggesting an anti-cariogenic effect (Bhatt *et al*., 2014). Hellqvist *et al*. through a clinical study revealed that there is no statistically significant difference in caries prevalence between snus (a form of ST) users and non-users (Hellqvist *et al*., 2015). Therefore to refine the conclusion and to get more sound association between ST consumption and dental caries, further studies are recommended.

Conclusion

Results of this study suggest that ST consumers are at a higher risk of experiencing dental caries when compared to non-tobacco consumers. Within the limitations of this study, it can be concluded that there is a significant correlation between the smokeless tobacco consumption and increased caries prevalence (DMFT score) in Dakshina Kannada population. Therefore ST consumption can be considered as a noteworthy risk factor for developing dental caries. This study also speaks in favour of a significant correlation between form of tobacco consumed and DMFT score (p=0.001).

REFERENCES

Ainamo J. The seeming effect of tobacco consumption on the occurrence of periodontal disease and dental caries. *SuomHammaslaakToim*., 1971;67(2):87-94.

Bhatt S, Rajesh G R, Pai MBH, Rao A, Shenoy R. Effects of refined extracts of smokeless tobacco on Cariogenic microorganisms: An in-vitro study. *International Journal of Advanced Research*, 2014; 2(4):847-852.

Cinar AB, Christensen LB, Hede B: Clustering of obesity and dental caries with lifestyle factors among Danish adolescents. *Oral Health & Preventive Dentistry*, 2011, 9:123–130.

Gauravi A. Mishra, Sharmila A. Pimple, and Surendra S. Shastri. An overview of the tobacco problem in india. *Indian J Med PaediatrOncol*., 2012 Jul-Sep; 33(3): 139–145.

Global Adult Tobacco Survey (GATS) India: 2009-2010. Available from http://www.searo.who.int/LinkFiles/ Regional_Tobacco_Surveillance_System_GATS_India.pdf Published by IIPS, Mumbai and funded by the Ministry of Health and Family Welfare, GOI 2010.

Going RE, Hsu SC, Pollack RL, Haugh LD. Sugar and fluoride content of various forms of tobacco. *J Am Dent Assoc*., 1980 Jan;100(1):27-33.

Hanioka T, Ojima M, Tanaka K, Yamamoto M: Does secondhand smoke affect the development of dental caries in children? A systematic review. *Int J Environ Res Public Health*, 2011, 8:1503–1519.

Hellqvist L, Rolandsson M, Hugoson A, Lingström P, Birkhed D. Dental caries and associated factors in a group of Swedish snus users. *Swed Dent J*., 2015;39(1):47-54.

Hellqvist L, Boström A, Lingström P, Hugoson A, Rolandsson M, BirkhedD.Effect of nicotine-free and nicotine-containing snus on plaque pH in vivo. *Swed Dent J*., 2012;36(4):187-94.

Holmén A, Strömberg U, Magnusson K, Twetman S. Tobacco use and caries risk among adolescents – a longitudinal study in Sweden. *BMC Oral Health*, 2013, 13:31.

Hsu SC, Pollack RL, Hsu AF, Going RE. Sugars present in tobacco extracts. *JAmDentAssoc*.,1980, Dec;101(6):915-8.

Huang R, Li M, Gregory RL. Effect of nicotine on growth and metabolism of Streptococcus mutans. *Eur J Oral Sci*., 2012; 120: 319–325.

Huang R, Li M, Gregory RL. Nicotine promotes Streptococcus mutans extracellular polysaccharide synthesis, cell aggregation and overall lactate dehydrogenase activity. *Arch Oral Biol*., 2015 Aug;60(8):1083-90.

Moller, I. J., J. J. PindborgAnd I. Effendi. The relation between betel chewing and dental caries. Scand. *J. Dent. Res*., 1977: 85: 64-70.

Peter S. Essentials of Preventive and Community Dentistry. New Delhi. AryaMedi Publishing House Pvt Ltd. 2009.

Reibel J. Tobacco and oral diseases. Update on the evidence, with recommendations. *Med PrincPract*., 2003; 12Suppl 1:22-32.

Tomar SL, Winn DM. Chewing tobacco use and dental caries among U.S. men. *J Am Dent Assoc*., 1999; 130: 1601–10.

Vellappally S, Fiala Z, Smejkalová J, Jacob V, Shriharsha P. Influence of tobacco use in dental caries development. *Cent Eur J Public Health*., 2007 Sep;15(3):116-21.

Winn DM. Tobacco use and oral disease. *J Dent Educ*., 2001 Apr;65(4):306-12.

****