

PERIODONTAL ISSUES; TOOTH LOSS AND ORAL HYGIENE MEASURES AMONG TOBACCO USING DRIVERS IN BENIN CITY

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ABSTRACT

Tobacco is known to exert adverse effect on general and oral health. The objective of the study was to assess gingivodental problems, tooth loss and oral hygiene status of tobacco using commercial drivers in Benin-City, Nigeria.

This study was conducted between November 2011 and January 2012 among male drivers of a private transport company principally involved in long distance commercial passenger travel with buses and taxis whose head office is in Benin-City. Data was collected through interview and clinical oral examination.

A total of 65 drivers whose mean age was 47.2years participated in the study. Of which, 24 (36.9%) were tobacco users and 41 (63.1%) non tobacco users. Tobacco users were more kolanut chewers and significant alcohol consumer than non tobacco users. Preventive dental visit and more than once-daily teeth cleaning especially using toothbrush and paste were lower among tobacco users than non users. Tobacco users reported more gingival swelling, longer teeth, food packing and dental caries but less gingival bleeding, tooth mobility and dentinal sensitivity than non users. Tobacco users had higher mean missing (0.63 ± 0.32 versus 0.37 ± 0.12) and carious teeth (0.38 ± 0.29 versus 0.17 ± 0.09), debris score (1.30 ± 0.15 versus 1.14 ± 0.09), calculus score (1.01 ± 0.15 versus 0.80 ± 0.07) and oral hygiene score (2.30 ± 0.28 versus 1.93 ± 0.15) than non users.

Overall, tobacco users had non significant higher prevalence of gingivodental problems, tooth loss and poorer oral hygiene than non tobacco users.

INTRODUCTION

Tobacco use has been reported by the World Health Organization as the single most common cause of preventable mortality worldwide.¹ Tobacco use harms almost all cells of the body resulting in multi-systemic manifestations ranging from mortality prone cancer to non cancer morbidity conditions.^{2,3} The oral cavity which is a route of delivery and primary site of

deposition of tobacco, is bound to manifest with morbid and mortality prone conditions.^{4,5} Tobacco use has detrimental effect on oral health constituting a major environmental factor associated with the development and progression of periodontal disease by undermining host response, increasing susceptibility to infection and diminution of positive response to treatment.⁶⁻⁸ Tobacco use has been recognized as a significant risk factor in the development and progression of periodontal disease. The prevalence and severity of gingival recession, periodontal pocket formation, clinical attachment loss, alveolar bone loss, furcation involvement, tooth mobility and eventual tooth loss are significantly increased in tobacco users in comparison with non users.^{6,7, 9-14}

KEYWORDS: *Periodontal health, tooth loss, oral hygiene, tobacco use*

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Differences also exist between smokers and non-smokers in respect of the treatment need assessed using Community Periodontal Index of Treatment Needs (CPITN) and number of intact tooth surfaces in all age groups with the worst parameters seen in smokers.²⁵ There also exist dose-dependent relationship between tobacco use and periodontal morbidity as heavy tobacco use is consistently associated with a more severe condition than light tobacco use.^{6,12} Smoking is significantly associated with higher organoleptic scores, and tongue coating and volatile sulphur compound (VSC) values.¹⁶ Self-perceived halitosis is significantly associated with either current or past smoking.¹⁷

Tobacco use exacerbates periodontal disease by interfering with vascular and immunologic reactions. This is usually due to the reduced proliferative capacities of tobacco exposed B- and T-lymphocytes, inadequate phagocyte activity and increased number of functionally compromised peripheral blood mononuclear phagocytes.⁹ Other effects of tobacco on periodontal tissues is through the actions of nicotine on gingival blood flow, connective tissue turnover, cytokine production, neutrophil and other immune cell function.¹⁸ Nicotine and carbon monoxide in tobacco smoke exert negative influence on wound healing.¹²

The stains from tobacco use which constitute soft debris and overall neglect of bodily hygiene including oral hygiene among tobacco users contribute to the causation of periodontal disease. There exist a significant association between smoking and plaque index with oral hygiene being inferior among smokers in comparison with non-smokers.¹⁹ Studies

have consistently demonstrated more oral health problems, poorer oral hygiene among tobacco users than non users thereby linking tobacco use with inadequate oral self-care and utilization of oral health services.²⁰⁻²³ The low level of awareness of negative effects of smoking on oral health among Nigerians has been documented in the literature.²⁴ The studies on oral hygiene practices, self-reported periodontal problems and tooth loss among tobacco users and non tobacco users are scarce in the literature. The objective of the study was to assess gingivodental problems, tooth loss and the oral hygiene status of tobacco using commercial drivers in Benin-City, Edo State, Nigeria.

MATERIALS AND METHODS

This study was conducted among drivers of a private transport company whose head office is in Benin-City and is principally involved in long distance passenger travel with buses and taxis between November 2011 and January 2012. Informed consent was obtained from the participants after being informed of the study objective and the confidentiality of their responses. Data were collected through interview and clinical oral examination. The questionnaire elicited information on age, gender, driving experience, tobacco use and type of tobacco, oral hygiene measures and self-reported oral health problems among the participants. The clinical examination was conducted in a well illuminated office approved by the management of the private motor park and temporarily prepared for the research. The sterilized mouth mirrors and dental explorers were used for the clinical examination of the participants and the examiners wore examination gloves and disposable face mask during the clinical examination to prevent cross infection. The clinical examination was done by two Periodontologists whose interexaminer

reliability was 95% at the pretesting stage. During the clinical oral examination, debris score, calculus score, oral hygiene score were recorded using the Simplified oral hygiene index (OHI-S). Carious, missing and filled teeth were also recorded using the standard Decayed, Missing, Filled teeth (DMFT) format. The absence of carious teeth was scored as 0, the presence of carious tooth or teeth was scored as 1 or higher number depending on the number of affected teeth. The scoring for missing and filled teeth were done in a similar manner. The data analysis was done using statistical package for social sciences (SPSS) version 17.0. Descriptive statistical analysis in form of cross tabulation was done to assess the relationship between tobacco use, oral health practices, and self-reported periodontal problems and tooth loss. The debris score, calculus score, oral hygiene score, carious teeth and missing teeth were presented as mean \pm standard error of mean (SEM). Test of significance was done using independent t-test, Fisher's exact and chi square statistics. The level of significance was set at $P < 0.05$.

RESULTS

A total of 65 drivers out of 90 drivers employed by the company who returned to the head office of company during the period of the study participated in the study. Of the 65 drivers, 24 (36.9%) and 41 (63.1%) were tobacco and non tobacco users respectively. Of the tobacco users, 18 (75.0%) of them smoked cigarette, 4 (16.7%) used smokeless tobacco (snuff) and 2 (8.3%) used both forms of tobacco (smoked and smokeless). A total of 24 (36.9%) and 32 (49.2%) of the participants were aged between 25 and 44 years and attained primary school level of education respectively. The majority of the participants 57 (87.7%) have been professional drivers for 10 years. Tobacco

users were non-significantly older drivers in terms of driving experience, aged 45-54 years and attained secondary education (Table 1). Tobacco users were more kolanut chewers and indulged significantly in alcohol consumption than non tobacco users (Table 2). Preventive dental visit (4.2% versus 5.1%), and more than once-daily teeth cleaning (29.2% versus 36.6%) especially using toothbrush and paste (75.0% versus 82.9%) were lower while receipt of tooth extraction were higher (29.2% versus 26.8%) among tobacco users than non users (Table 3). Tobacco users reported more gingival swelling (25.0% versus 19.5%), longer teeth (4.2% versus 2.4%), food packing (75.0% versus 68.3%) and dental caries (20.8% versus 14.6%) but less gingival bleeding (12.5% versus 29.3%), tooth mobility (0.0% versus 9.8%) and dentinal sensitivity (25.0% versus 29.3%) than non users (Table 4). Tobacco users had higher mean missing (0.63 ± 0.32 versus 0.37 ± 0.12) and carious teeth (0.38 ± 0.29 versus 0.17 ± 0.09), debris score (1.30 ± 0.15 versus 1.14 ± 0.09), calculus score (1.01 ± 0.15 versus 0.80 ± 0.07) and oral hygiene score (2.30 ± 0.28 versus 1.93 ± 0.15) than non tobacco users (Table 5).

DISCUSSION

Tobacco use has detrimental effect on oral health constituting a major environmental factor associated with the development and progression of periodontal disease by undermining host response, increasing susceptibility to infection and diminution of positive response to treatment.⁶⁻⁸ Although not statistically significant, tobacco users reported more gingival swelling, perceived longer teeth and food packing but less gingival bleeding, tooth mobility and dentinal sensitivity in this study. The lower prevalence of gingival bleeding among tobacco users especially cigarette smokers has long been

Table 1: Demographic characteristics of participants

Characteristics	Tobacco			P-value
	User	Non user	Total	
	n (%)	n (%)	n (%)	
Age (years)				0.05
25-44	9 (37.5)	15 (36.6)	24 (36.9)	
45-54	11 (45.8)	9 (22.0)	20 (30.8)	
55-64	4 (16.7)	17 (41.5)	21 (32.3)	
Educational attainment				0.58
Primary	10 (41.7)	22 (53.7)	32 (49.2)	
Secondary	13 (54.2)	18 (43.9)	31 (47.7)	
Tertiary	1 (4.2)	1 (2.4)	2 (3.1)	
Driving experience (years)				0.97
≤10	3 (12.5)	5 (12.2)	8 (12.3)	
>10	21 (87.5)	36 (87.8)	57 (87.7)	

Table 2: Social habits among the tobacco and non tobacco users

Habit	Tobacco			P-value
	Users	Non user	Total	
	n (%)	n (%)	n (%)	
Alcohol consumption				0.04
Often	5 (20.8)	1 (2.4)	6 (9.2)	
Occasionally	17 (70.8)	34 (82.9)	51 (78.5)	
Never	2 (8.3)	6 (14.6)	8 (12.3)	
Kolanut chewing				0.07
Often	1 (4.2)	1 (2.4)	2 (3.1)	
Occasionally	13 (54.2)	12 (29.3)	25 (38.5)	
Never	10 (41.7)	28 (68.3)	38 (58.5)	

Table 3: Oral health practices among the tobacco and non tobacco users

Characteristics	Tobacco			P-value
	Users	Non user	Total	
	n (%)	n (%)	n (%)	
Tooth cleaning material				0.20
Chewing stick	2 (8.3)	0 (0.0)	2 (3.1)	
Toothbrush and paste	18 (75.0)	34 (82.9)	52 (80.0)	
Both	4 (16.7)	7 (17.1)	11 (16.9)	
Daily tooth brushing frequency				0.54
Once	17 (70.8)	26 (63.4)	43 (66.2)	
>Once	7 (29.2)	15 (36.6)	22 (33.8)	
Preventive dental visit				1.00
Yes	1 (4.2)	2 (5.1)	3 (4.6)	
No	23 (95.7)	39 (95.1)	62 (95.4)	
Receipt of tooth extraction				1.00
Yes	7 (29.2)	11 (26.8)	18 (27.7)	
No	17 (70.8)	30 (73.2)	47 (72.3)	

Table 4: Self-reported gingivodental problems among the tobacco and non tobacco users

	Tobacco		Total n (%)	P-value
	Users n (%)	Non user n (%)		
Gingivodental problems				
Gingival bleeding				0.12
Yes	3 (12.5)	12 (29.3)	15 (23.1)	
No	21 (87.5)	29 (70.7)	50 (76.9)	
Gingival swelling				0.60
Yes	6 (25.0)	8 (19.5)	14 (21.5)	
No	18 (75.0)	33 (80.5)	51 (78.5)	
Tooth mobility				0.29
Yes	0 (0.0)	4 (9.8)	4 (6.2)	
No	24 (100.0)	37 (90.2)	61 (93.8)	
Longer teeth				1.00
Yes	1 (4.2)	1 (2.4)	2 (3.1)	
No	23 (95.8)	40 (97.6)	63 (96.9)	
Food packing				0.57
Yes	18 (75.0)	28 (68.3)	46 (70.8)	
No	6 (25.0)	13 (31.7)	19 (29.2)	
Dentinal sensitivity				0.71
Yes	6 (25.0)	12 (29.3)	18 (27.7)	
No	18 (75.0)	29 (70.7)	47 (72.3)	
Dental caries				0.52
Yes	5 (20.8)	6 (14.6)	11 (16.9)	
No	19 (79.2)	35 (85.4)	54 (83.1)	

Table 5: Tooth loss, carious teeth, debris, calculus and oral hygiene scores among the tobacco and non tobacco users

Parameter	Tobacco			t	P-value
	Users	Non user	Total		
	Mean± SEM	Mean± SEM	Mean± SEM		
Missing teeth	0.63±0.32	0.37±0.12	0.25±0.12	0.89	0.38
Cariou teeth	0.38 ± 0.29	0.17±0.09	0.46±0.14	0.81	0.42
Debris score	1.30 ± 0.15	1.14 ±0.09	1.20±0.08	0.96	0.34
Calculus score	1.01±0.15	0.80±0.07	0.87±0.07	1.41	0.17
Oral hygiene score	2.30±0.28	1.93±0.15	2.07±0.14	1.28	0.37

established. Even with similarity in plaque index, gingival bleeding is significantly lower in smokers than non-smokers due to the significantly suppressed gingival bleeding response to plaque.^{18,25} The vasoconstrictive effect of nicotine and keratinization of oral mucosa with tobacco use is also known to result in decreased gingival bleeding in tobacco users in comparison with non users.¹⁸

The self-reporting of longer teeth which is an indicator of gingival recession, gingival swelling, food packing among tobacco users reflects the roles of tobacco in predisposing users to different categories of periodontal diseases. Tobacco-induced alterations in microbial and host factors are major contributor to the deleterious periodontal effects.²⁶ The lower report of tooth mobility and dentinal sensitivity among tobacco users may appear inconsistent with the findings from previous studies.²⁷⁻²⁸ However, the higher receipt of tooth extraction among tobacco users in this study may be a reasonable explanation, as tobacco users may have undergone extraction of their mobile teeth.

Tobacco users had higher mean missing (0.63 ± 0.32 versus 0.37 ± 0.12) and carious teeth (0.38 ± 0.29 versus 0.17 ± 0.09), debris score (1.30 ± 0.15 versus 1.14 ± 0.09), calculus score (1.01 ± 0.15 versus 0.80 ± 0.07) and oral hygiene score (2.30 ± 0.28 versus 1.93 ± 0.15) than non tobacco users. Tobacco users also self reported more dental caries than non tobacco users. Previous studies in Nigeria similarly documented poorer oral hygiene, less healthy periodontium, more calculus, and more periodontal pocketing among smokers than non-smokers.^{29,30} This therefore means that tobacco use predisposes to higher plaque accumulation,

tooth loss, probing attachment loss and dental caries.^{15,31} Preventive dental visit rather than curative dental visit (receipt of tooth extraction) and teeth cleaning with toothbrush and paste may be the explanations for lower dental caries among non tobacco users as the fluoride content of the toothpastes helps to prevent and retard the progression of dental caries. The fact that tobacco users in this study were more kolanut chewer and alcohol consumer are contributory explanations as kolanut chewing has additive effect to the staining from tobacco thereby constituting a substantive plaque retentive factor. The alcohol consumption is related with some form of neglect in bodily hygiene including oral hygiene thereby culminating in increased plaque score, calculus score and oral hygiene score and dental caries.³²

CONCLUSION

Overall, tobacco users had non significant higher prevalence of gingivodental problems and tooth loss and poorer oral hygiene than non tobacco users. These therefore mean that consideration should be given to tobacco users in terms of tobacco cessation services while rendering oral healthcare in order to reduce tooth loss and improve their overall periodontal health.

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