ORIGINAL ARTICLE

PATTERNS AND HABITS OF TOOTH SURFACE LOSS IN ASSOCIATION WITH TOOTH BRUSHING/ SOFT DRINK CONSUMPTION AMONGST 18-34 YEARS OF ADULTS

[1]AISHA WALI, (BDS, MPhil Trainee-Operative Dentistry
[2]TALHA M SIDDIQUI, BDS, MCPS, MPhil Trainee-Operative Dentistry
[3]SYED ZUBAIRUDDIN AHMED, BDS, MSc-Operative Dentistry
[4]SANA SOBIA, BDS

ABSTRACT

A cross sectional was conducted to assess the patterns and habits of tooth surface loss in association with tooth brushing/ soft drink consumption amongst 18-34 years old. One hundred healthy patients of 18-34 years of age with tooth surface loss were included in the study. A structured Questionnaire was filled by each patient which included patients' demographic data, information on patients presenting complaints. Past dental history was also asked. Data was statistically analyzed for descriptive statistics by performing chi- square test, using SPSS version 19. p- value was set at 0.05. 12(60%) of females who consumed soft drinks sometimes, reported localized tooth surface loss in anterior teeth and 2(66.7%) of females reported generalized tooth surface loss on consumption of soft drinks . 10(52.6%) of females who brushed their teeth regularly reported localized tooth surface loss in anterior teeth and 2(50%) of females reported generalized tooth surface loss. 11(55%) of females reported localized tooth surface loss who brushed their teeth once a day and 3(60%) of females reported generalized tooth surface loss. 19(70.4%)of males who brushed their teeth for 1min reported localized tooth surface loss in anterior teeth and 2(66.7%) of males reported generalized tooth surface loss .Soft drink intake in daily life has become challenging. The present survey was done in a small sample of population to assess the correlation of tooth surface loss with soft drink consumption and improper brushing habits.

Key Words: *tooth surface loss, oral habits, dental erosion, soft drink consumption.*

INTRODUCTION

Tooth surface loss is defined as the non carious loss of dental hard tissue due to various forms of physical and chemical factors.[1] The etiology is multifactorial and includes the effects of impact forces occurring during tooth flexure, the action of opposing teeth and the chemical dissolution of tooth surface. Considering the fact that lost tissue cannot regenerate, this tooth surface loss process is of great clinical significance.[2] The prevalence of cervical wear has been reported to vary between 5-85%.[3,4] Prevalence of surface wear is on the increase, however it is not yet confirmed if this increase is due to increased awareness amongst patients and dental health care professionals or as a result of changes in diet and lifestyles or indeed combination of these factors.[5,6] This increase in prevalence and severity is of concern to dental health care professionals.[7,8] Oral hygiene habits results in loss of tooth surface which included dietary habits, brushing techniques, bruxism, parafunctional habits and regurgitation.[9] Epidemiological data, and studies in vitro and in situ suggested that out of the three individual wear processes, erosion is the most common form of tooth surface loss.[10,11] Soft drinks, such as carbonated beverages,[12-15] fruit juices,[16-19] and sport drinks[20-23], showed acidic pH which causes loss of the dental hard tissue. A study reported that 68% of the subjects aged 19-24 years had tooth erosion.[24] The multifactorial nature of tooth surface loss and its risk factors are relatively important in diagnostic protocols and management strategy of patients.[25]

Tooth brushing is an essential part of oral health, which helps in removal of plaque and debris in order to contribute to maintain good oral and periodontal health. Most of the patients found difficult to clean their teeth

[1] Senior lecturer, Operative Dentistry, Baqai Dental College, Karachi Cell: 03002248518 Email: aishawali@hotmail.com
[2] Associate Professor, Operative Dentistry, Baqai Dental College, Karachi
[3] Lecturer, Operative Dentistry, University of Dammam, Saudi Arabia
[4] Dental House Surgeon, Baqai Dental College, Karachi
Received for Publication: October 10, 2014
Revision Received: November 11, 2014
Revision Accepted: November 20, 2014

sufficiently, and the daily experience is that patients still exhibit plaque accumulation, even though they reportedly engage in maintaining oral hygiene.[2]

The aim of the present study was to assess the patterns and habits of tooth surface loss in association with tooth brushing/ soft drink consumption amongst 18-34 years old.

METHODOLOGY

The present cross sectional study was carried out in Out Patient Department of Operative Dentistry, Baqai Dental College, Karachi from June 2012 - May 2013. One hundred healthy 18-34 years old adults with tooth surface loss were randomly sampled. Patients reported with dental caries, pulpitis, periapical infection and restored dentition were excluded from the study. Ethical approval was obtained from ethical committee Baqai Medical University. A written consent was also signed by each patient. A structured Questionnaire was filled by each patient which included patients' demographic data, information on patients' presenting complaint and past dental history. Medical history of eating disorders, gastritis, reflux, reduced salivary flow were assessed. Oral hygiene practice, soft drink consumption, acidic food intake and potential occupational factors or habits were also evaluated. One well trained calibrated examiner performed the clinical examination using a dental unit, disposable mouth mirrors and dental probes. According to the guidelines of Kelleher and Bishop. Clinical oral examination included the cemento-enamel junction for abrasion and labial, buccal, lingual, palatal surfaces for erosion.

Data were statistically analyzed for descriptive statistics and cross tabulation was done by performing chi- square test using SPSS version 19 to evaluate the relationship between tooth surface loss with soft drink consumption / tooth brushing. p- value was set at 0.05.

RESULTS

A total of one hundred subjects, 50 males and 50 females aged 18-34 years participated in the study. Soft drink consumption was recorded as No consumption, Sometimes, Once a day, Twice a day and More than twice. 12(60%) of females who consumed soft drinks sometimes, reported localized tooth surface loss in anterior teeth and 2(66.7%) of females reported generalized tooth surface loss on consumption of soft drinks. Table 1 shows the relationship of tooth surface loss with soft drink consumption. Tooth brush abrasion was recorded as frequency of brushing teeth, time spent on brushing and daily habit of brushing teeth. 10(52.6%) of females who brushed their teeth regularly reported localized tooth surface loss in anterior teeth and 2(50%) of females reported generalized tooth surface loss. Table 2 shows relationship of tooth brushing with tooth surface loss. 11(55%) of females reported localized tooth surface loss who brushed their teeth once a day and 3(60%) of females reported generalized tooth surface loss. Table 3 shows association of frequency of tooth brushing with tooth surface loss. 19(70.4%) of males who brushed their teeth for one minute reported localized tooth surface loss in anterior teeth and 2(66.7%) of males reported generalized tooth surface loss. Table 4 shows effect of time spent on brushing on tooth surface loss.

DISCUSSION

The present study results showed that 80% of females, who consumed soft drinks sometimes, reported localized tooth surface loss in anterior teeth and 66.7% of females reported generalized tooth surface loss on consumption of soft drinks sometimes. Similar findings were reported in a study by Tomasik, that showed an association between consumption of acidic drinks and tooth wear mostly in premolars.[25] A significantly higher erosion scores were found in Icelandic adolescent patients consuming more than 1 of carbonated drinks per week than those who did not.[26] Tooth brushing is considered to be an important factor in oral hygiene practices. However, overzealous tooth brushing habits provoked a thought to damage oral soft tissues and may cause tooth surface loss.[27] Tooth brushing is considered an etiological factor for wedge shape defects.[28] and has raised particular interest in the field of dental erosion, where tooth brushing abrasion is considered a significant co-factor for tooth surface loss.[1,29] Tooth brush abrasion was recorded as frequency of brushing teeth, time spent on brushing and daily habit of brushing teeth. 5(55.6%) of males who brushed their teeth twice a day reported localized tooth surface loss in anterior teeth and 2(100%) of males reported generalized tooth surface loss. Bergstron J and Lavstedt, Randentz et al[30], also reported no statistical dissimilarity owing to gender pertaining to abrasion of teeth. American Dental Association recommends brushing the teeth twice a day with gentle force and with circling or sweeping movement.[2] The present study result reported that 2(66.7%) of male subjects who brushed their teeth for one minute and two minute showed generalized tooth surface loss. Females brushed more frequently than males and in general had what would be accepted as better oral hygiene practices which resulted in lower levels of abrasion in females. Thorough brushing of the teeth should also last at least 2 minutes. These recommendations appear to be generally accepted in dental public health educational programmes.[2] The major effect of brushing on plaque reduction is reached after 30 seconds brushing time per quadrant adding up to a total brushing duration of 120 seconds. Findings from studies investigating the amount of time spent on brushing revealed that this is not reached in daily

TABLE 1: EFFECT OF SOFT DRINK CONSUMPTION ON TOOTH SURFACE LOSS

	Soft drink consumption	Tooth wear No	Localized anterior teeth	Generalized tooth wear	P- value
Male	No	18.80%	21.40%	25%	
	sometimes	59.40%	57.10%	25%	0.508
	once	15.60%	7.10%	50%	
	twice	6.30%	7.10%	0%	
	more than twice	0%	7.10%	0%	
Female	No	21.90%	20%	33.30%	
	sometimes	68.80%	80%	66.70%	0.721
	once	9.40%	0%	0%	
	twice	0%	0%	0%	
	more than twice	0%	0%	0%	

TABLE 2: EFFECT OF TOOTH BRUSHING ON TOOTH SURFACE LOSS IN MALE/ FEMALE

	Brushing	Tooth wear No	Localized anterior teeth	Generalized tooth wear	P- value
Male	Sometimes	28.1%	28.6%	25%	
	Yes	62.5%	64.3%	50%	0.887
	No	9.4%	7.1%	25.0%	
Female	Sometimes	9.4%	26.7%	33.3%	
	Yes	75.0%	66.7%	66.7%	0.45
	No	15.6%	6.7%	0.0%	

TABLE 3: ASSOCIATION OF FREQUENCY OF TOOTH BRUSHING WITH TOOTH SURFACE LOSS

	Frequency	Tooth wear No	Localized anterior teeth	Generalized tooth wear	P- value
Male					
	Once	78.10%	64.30%	50%	
	Twice	21.90%	35.70%	50%	0.374
Female					
	Once	65.60%	73.30%	100%	
					0.437
	Twice	34.40%	26.70%	0%	

TABLE 4: EFFECT OF TIME SPENT ON BRUSHING ON TOOTH SURFACE LOSS

	Time spending	Tooth wear No	Localized anterior teeth	Generalized tooth wear	P- value
Male					
	30 sec	12.50%	7.10%	0%	
	1 min	59.40%	64.30%	50%	0.888
	2 min	21.90%	21.40%	50%	
	3 min	6.30%	7.10%	0%	
Female	30 sec	25%	13.30%	33.30%	
	1 min	25%	46.70%	33.30%	0.671
	2 min	40.60%	40%	33.30%	
	3 min	9.40%	0%	0%	

life. Older studies estimated that brushing time ranges between 30 and 60 seconds.[31] Ganss et al[2] reported brushing habits with respect to gender, the only significant difference was in brushing force, which was slightly higher in males.

CONCLUSION

Soft drink intake in daily life has become challenging. The present survey was done in a small sample of population to assess the correlation of tooth surface loss with soft drink consumption and improper brushing habits. Gender has no significant influence with the etiology of tooth surface loss. To prevent this problem from being worse and become a burden, this should be diagnosed and managed in its early stage. The dental public health awareness programs should be planned regarding frequent soft drink consumption, which is directly associated with tooth surface loss.

REFERENCES

1 Addy, M. and Shellis, RP. Interaction between attrition, abrasion and erosion in tooth wear. Monographs in Oral Sciences.2006; 20: 17-31.

2 Ganss C, Schlueter N, Preiss S. Tooth brushing habits in uninstructed adults — frequency, technique, duration and force. Clin Oral Investig. 2009; 13(2): 203-08.

3 Hong FL, Nu ZY, Xie, XM. Clinical classification and therapeutic design of dental cervical abrasion. Gerodontics 1988; 4(2):101-3.

4 Yadav S, Saxena V, Reddy R ,Deshpande N, Deshpande A , Kovvuru S. Alliance of oral hygiene practices and abrasion among urban and rural residents of Central India. Journal of Contemporary Dental Practice J. 2012; 13(1) 55-60.

5 Harley K. Tooth wear in the child and the youth. Br Dent J.1999; 186(10):492–6.

6 Shaw L, Smith AJ. Dental erosion—the problem and some practical solutions. Bri Dent J.1999; 186(3): 115–8.

7 Dugmore CR, Rock WP. The prevalence of tooth erosion in 12-year-old children. Bri Dent J. 2004; 196(5):279–82.

8 Bardsley PF, Taylor S, Milosevic A. Epidemiological studies of tooth wear and dental erosion in 14-year-old children in North West England. Part 1: the relationship with water fluoridation and social deprivation. Bri Dent J.2004; 197(7): 413–6.

9 Christensen GJ. Treating bruxism and clenching. J Am Dent Assoc.2000; 131(2): 233-5.

10 Nunn JH: Prevalence and distribution of tooth wear; in Addy M, Embery G, Edgar WM, Orchardson R (eds): Tooth Wear and Sensitivity. London, Martin Dunitz, 2000, pp 93–104.

11 Zero DT, Lussi A: Etiology of enamel erosion: intrinsic and extrinsic factors; in Addy M, Embery G, Edgar WM, Orchardson R (eds): Tooth Wear and Sensitivity. London, Martin Dunitz, 2000, pp 121–140.

12 Kitchens M, Owens BM. Effect of carbonated beverages, coffee, sports and high energy drinks, and bottled water on the in vitro erosion characteristics of dental enamel. J Clin Pediatr Dent. 2007; 31(3):153-9.

13 Devlin H, Bassiouny M A, Boston D. Hardness of enamel exposed to Coca Cola and artificial saliva. J Oral Rehabil. 2006; 33(1):26-30.

14 Moazzez R, Smith BG, Bartlett DW. Oral pH and drinking habit during ingestion of a carbonated drink in a group of adolescents with dental erosion. J Dent. 2000; 28(6):395-7.

15 Maupome G, Diez J, Torres G, Andrade C, Castano V. In vitro quantitative assessment of enamel microhardness after exposure to eroding immersion in a cola drink. Caries Res. 1998; 32(2):148-53.

16 Ren Y, Amin A, Malmstrom H. Effects of tooth whitening and orange juice on surface properties of dental enamel. J Dent. 2009; 37(6):424-31.

17 Zandim DL, Correa F, Rossa C, Sampaio J. In vitro evaluation of the effect of natural orange juices on dentin morphology. Braz Oral Res. 2008; 22(2):176-83.

18 Willershausen B, Callaway A, Azrak B, Duschner H. Influence of apple juice on human enamel surfaces of the first and second dentition - an in vitro study. Eur J Med Res. 2008; 13(7):349-54.

19 West NX, Maxwell A, Hughes JA, Parker DM, Newcombe RG, Addy M. A method to measure clinical erosion: the effect of orange juice consumption on erosion of enamel. J Dent. 1998 ; 26(4):329-35.

20 Lussi A, Jaeggi T, Jaeggi-Scharer S. Prediction of the erosive potential of some beverages. Caries Res.1995;29(5):349-54.

21 Coombes JS. Sports drinks and dental erosion. Am J Dent. 2005; 18(2):101-4.

22 Milosevic A. Sports drinks hazard to teeth. Brit J Sports Med. 1997; 31(1):28-30.

23 Rees J, Loyn T, McAndrew R. The acidic and erosive potential of five sports drinks. Eur J Pros Restor Dent. 2005 ; 13(4):186-90.

24 Manaf ZA, Lee MT, Ali NH, Samynathan S, Jie YP, Ismail NH etal. Relationship between Food Habits and Tooth Erosion Occurrence in Malaysian University Students. Malays J Med Sci. 2012; 19(2): 56-66.

25 Tomasik M, Etiological Analysis of factors involved in noncarious cervical lesions. Ann Acad Med Stetin. 2006; 52 (3): 125-36.

26 Jensdottir T, Arnadottir IB, Thorsdottir I,Bardow A, Gudmundsson K, Theodors A, Holbrook WP. Relationship between dental erosion, soft drink consumption, and gastroesophageal reflux among Icelanders.Clin Oral Invest 2004; 8: 91-6.

27 Van der F, Danser MM. Toothbrushes: benefits versus effects on hard and soft tissues. In: Addy M, Embery G, Edgar WM, Orchardson R (eds). Tooth wear and sensitivity. Dunitz, M., London, 2000; p 217–236.

28 Bartlett DW, Shah P. A critical review of non-carious cervical (wear) lesions and the role of abfraction, erosion, and abrasion. J Dent Res.2006; 85:306–312.

29 Lussi A, Jaeggi T. Erosion—diagnosis and risk factors. Clin Oral Invest.2008; 12:5–13.

30 Bergstrom J, Lavestdt S. An epidemiological approach to tooth brushing and dental abrasion. Comm. Dent. Oral Epidem. 1979; 7: 57-64.

31 Van der A, Timmerman MF, Nijboer A, Lie MA, Van der VU. A comparative study of electric toothbrushes for the effectiveness of plaque removal in relation to toothbrushing duration. Timerstudy. J Clin Periodontol.1993; 20(7):476–81.