

Patterns of Tooth Surface Loss among Winemakers

Patterns of Tooth surface loss among Winemakers
SADJ October 2005
Vol. 60 no 9 pp 370 - 374

Prof UME Chikte, BChD (UWC), MSc (London),
DHSM (Wits), MDent (Wits), PhD (US), Department
of Community Health, University of Stellenbosch,
Tygerberg, 7505.

Prof S Naidoo, BDS (Lon), LDS.RCS (Eng), MDPH
(Lon), DDPH.RCS (Eng), MChD (Comm Dent),
PhD (US), Department of Community Oral Health,
University of the Western Cape, Tygerberg.

TJ vW Kotze, DSc; TheoData cc, 27 Haarlem Rd 7550
Durbanville

Prof SR Grobler, MSc, PhD, DSc., Oral and Dental
Research Institute, Faculty of Dentistry, University of
the Western Cape, Tygerberg, 7505.

Corresponding author:
Prof UME Chikte
Faculty of Health Sciences
University of Stellenbosch
P O Box 19063
TYGERBERG
7505

Tel: (021) 938 9095 (w)
Fax: (021) 939 9558
e-mail: umec@sun.ac.za

ABSTRACT

There are a few documented case studies on the adverse effect of wine on both dental hard and soft tissues. Professional wine tasting could present some degree of increased risk to dental erosion. Alcoholic beverages with a low pH may cause erosion, particularly if the attack is of long duration, and repeated over time. The purpose of this study was to compare the prevalence and severity of tooth surface loss between winemakers (exposed) and their spouses (non-exposed).

Utilising a cross-sectional, comparative study design, a clinical examination was conducted to assess caries status; the presence and severity of tooth surface loss; staining (presence or absence); fluorosis and prosthetic status. The salivary flow rate, buffering capacity and pH were also measured.

Thirty-six persons, twenty-one winemakers and fifteen of their spouses participated in the study. It was possible to show that there was a difference in terms of the prevalence and severity of tooth surface loss between the teeth of winemakers

and those who are not winemakers. The occurrence of tooth surface loss amongst winemakers was highly likely due to frequent exposure of their teeth to wine. Frequent exposure of the teeth to wine, as occurs among wine tasters, is deleterious to enamel, and constitutes an occupational hazard. Erosion is an occupational risk for wine tasters.

INTRODUCTION

Evidence suggests that moderate consumption of alcoholic beverages has both health and nutritional benefits.¹ The relationship between exposure to alcohol and oral health status may, however, be different. Professional wine tasters and winemakers of a winemaking consortium near Stellenbosch, South Africa, approached the researchers to assess their perceived deteriorating oral health status.

There are a few documented case studies on the adverse effect of wine on both dental hard and soft tissues.²⁻⁵ Professional wine tasting could present some degree of increased risk to dental erosion.⁶⁻⁸ Since the critical pH of the surface of dental enamel is approximately 5.6, any solution with a lower pH value, such as alcoholic beverages, may cause erosion, particularly if the attack is of long duration, and repeated over time. Saliva and salivary pellicle counteract acid attacks, but if the challenge is too severe, destruction of the tooth follows.

Erosion of tooth tissue can have catastrophic consequences for oral health. Tissue loss can result in sensitivity or pain as well as poor appearance. As the loss of enamel and dentine becomes more severe, the teeth become disfigured and lose their original shape and size, which can lead to the loss of affected teeth. Many patients with dental erosion do not report deterioration in appearance until there has been sufficient loss of tooth tissue, particularly on the palatal surfaces of maxillary incisors, for the thinned incisal edges to fracture.

The clinical appearance of erosion, in its early stages, is easy to overlook, bearing in

mind that there will be no discolouration of the tooth or any stickiness during probing of the lesion and perhaps only limited or no symptoms. In the late stage of dental erosion, however, the clinical appearance is more obvious. The surface appearance of erosion can be shiny or matt, and may be irregular, but is often rounded or flat, as if "melted". Small concavities can sometimes be seen on the surface of the tooth. In advanced cases, shoulders could be present cervically. Approximal surfaces are seldom involved in erosive lesions. Cuppings, a "peephole" in the enamel, often at a molar cusp tip, are a common clinical feature of an erosive lesion. In addition, formation of clinically detectable protective secondary dentine or direct pulpal involvement may occur. The pulp may be seen through the tooth substance, especially on deciduous teeth, when the erosive process is rapidly progressing. The erosive process may cause sensitivity and various degrees of other endodontic symptoms, besides the obvious loss of tooth substance resulting in aesthetic and/or functional problems.

Tooth surface loss that is not due to caries, trauma or operative procedures is often described as erosion (loss of tooth structure by a chemical process other than bacteria), attrition (loss of wear resulting from tooth to tooth contact) or abrasion (loss of tooth substance due to wear by extraneous objects). Abfraction refers to the loss of hard tissue, from eccentric occlusal loads leading to compressive and tensile stresses at the cervical fulcrum areas of the teeth, which produces defects at the cement-enamel junction. These processes can occur independently or in combination and Eccles suggested the use of the term "tooth surface loss" to describe these lesions.⁹ Tooth surface loss is the preferred term for this study.

In South African wines, the pH varies from 3.5 - 4.0 for red wines, 3.2 - 3.5 for white wines and 2.9 - 3.1 for sparkling wines. The sugar content of the wines vary from 180-400 g/L. In general, winemakers are exposed to 12-60 tastings per day, according to the season. Tastings involve swilling (rolling around the tongue so that it reaches the sides and base of the tongue)

of the wine for approximately 15 seconds at a time and spitting it out. Consequently, a winemaker's dentition is repeatedly exposed to an acidic solution - an ideal situation for erosion to occur.

Demineralisation of enamel commences at two critical points at about pH 6.2 and then the main critical point at approximately pH 5.6.^{10,11} This may lead to severe or total destruction of the teeth, depending on the strength in terms of low pH, low calcium, phosphorus, chelating properties and frequency of the erosive attacks.^{10, 12} The purpose of the study was to compare the prevalence and severity of tooth surface loss between winemakers (exposed) and their spouses (non-exposed).

MATERIALS AND METHODS

Within a descriptive, cross-sectional, comparative study design, all winemakers and assistant winemakers employed at the winemaking consortium were requested to participate in the study and consent thereto. In addition, their spouses - being the most suitable control in terms of lifestyle, age and diet - were selected to participate in the study to balance for confounding variables (lifestyle in general), except for wine tasting. The study was granted ethical approval by the Research Committee of the University of Stellenbosch (Project Number: 99/011).

A clinical examination was conducted to assess caries status;¹³ the presence and severity of tooth surface loss;¹⁴ staining (presence or absence); fluorosis and prosthetic status.¹³ Two persons were involved in the examinations and their agreement score was over eighty percent. Ten percent of the sample was re-examined using duplicate examinations and the level of agreement reached was over eighty percent. The salivary flow rate, buffering capacity and pH were also measured.

Codes used to measure tooth surface loss were graded as follows: Grade 0 indicated no clinical evidence of tooth surface loss; Grade 1 represented loss of enamel surface, giving a smooth glazed surface with no dentine involvement; Grade 2 showed involvement of the dentine for less than one third of the area of the tooth surface and Grade 3 indicated involvement of the dentine for more than one third of the area of the tooth surface.

Measurement Definitions

The calculations of the number of tooth surfaces that had a tooth surface loss

score of 1, 2 or 3, were adjusted for missing tooth surfaces (i.e. teeth coded 8 and 9 were eliminated from the calculations). The number of surfaces on which any Tooth Surface Loss (Tsl) of Grade 1, 2 or 3 occurred was added together to provide an unweighted composite score and is referred to as the SumSurface123. When only the severe scores, namely Grades 2 and 3 were added together, this unweighted composite score is referred to as the SumSurface23. Another method used was to weight the Grades according to the severity and then add it together. The more severe instances of tooth surface loss were weighted by means of ordinal constants e.g. a score of 2 was multiplied by 2 and a score of 3 was multiplied by 3. This weighted composite score is referred to as the WgtdSumSurface.

The data was recorded in the Excel® Package according to a questionnaire with separate sections for the biographical information, the dental status of the subjects working in the wine industry and the control subjects. Descriptive statistical measures were calculated for the independent groups: the subjects working in the wine industry (wine tasters) and a group of control subjects not working in the wine industry. The descriptive statistical measures included means, medians, standard deviations and in some cases non-parametric measures, such as the inter-quartile range for the interval-data. Due to the small sample size, distributional difficulties and the high number of ordinal and nominal measurements, non-parametric statistical techniques were the method of choice for most of the analyses.

RESULTS

General findings

Thirty-six persons, twenty-one winemakers and fifteen of their spouses participated in the study and all of them were included in the analyses. Of the fifteen matched pairs, in terms of cohabitation, only three were female winemakers as winemaking is a male dominated profession. Two homogeneous groups of reasonable size for statistical analysis were found in the study, namely the male exposed group comprising of eighteen individuals and the female non-exposed group made up of twelve persons. To provide greater statistical power, all the results were presented for exposed and non-exposed groups.

The average age of the males (40.8 years ranging from 26 to 53 years) in the exposed group was greater by seven years

compared to the male non-exposed group (33.3 years ranging from 27 to 41 years) whereas the reverse was true for the females. The average age for the female exposed group was 29.0 years (from 25 to 36 years) while the average age for the female non-exposed group was 41.2 years (ranging from 28 to 52 years).

The mean years employed in the wine industry as winemakers was 8.2 years while the female non-exposed group (spouses) was employed in non-wine related areas for about nine years. Everyone consumed alcohol in the study except for one teetotaler. There was a large variation of the type, frequency and amount of alcohol consumed within the sample as a whole and within the different subgroups. Wine tasting, as part of the winemaking process, among the exposed group took place regularly, ranging from 50 to 150 tastings per day. A third of the twenty one wine tasters and winemakers reported doing so (rinsing their mouths with wine during tasting) on a weekly basis. Wine was kept in the mouth for ten up to thirty seconds. Most individuals did not rinse with any fluid after a tasting.

All had nutritionally well balanced diets with low sugar content and a food intake frequency of 4-5 times a day. Fruit and especially citrus fruit intake was reported by most of the participants. Almost all the subjects usually drank wine with their dinner. Brushing was practised at least twice a day, and regular visits to a dentist was reported by all the participants as most of them belonged to a high socio-economic category and had access to third party funding for their health needs. Only one wine taster was alerted by his dentist to the possibility of dental erosion on account of his occupation.

Oral Health Status

Differences in the results of the extra oral examinations, oral mucosal lesions, fluorosis and prosthetic status were largely not noteworthy. The Plaque Index was lower among females, but the difference between males and females was not significant.

The average DMFT was eighteen for both exposed (male cases) and non-exposed (female cases) groups. The D - component was the smallest part of the DMFT and was less than 0.2 of the total DMFT for the entire sample. The average M - component was the second smallest part (3.5) of the DMFT. The F - component comprised the

bulk of the mean DMFT with an average of 13.0. Generally, the average DMFT increased with increasing age. One out of four of the non-exposed females reported a smoking habit, compared to seventeen percent of the male exposed group. For the male exposed group who were non-smokers, the average stain score was 11.9 compared to 13.3 for the smokers. Staining was more than twice the score in the smoking group (8.4, sd 6.3) compared to the female non-exposed group (4.0, sd 4.2).

There were no statistical differences between exposed (12.6, sd 9.8) and non-exposed (6.2, sd 5.6) groups in terms of staining

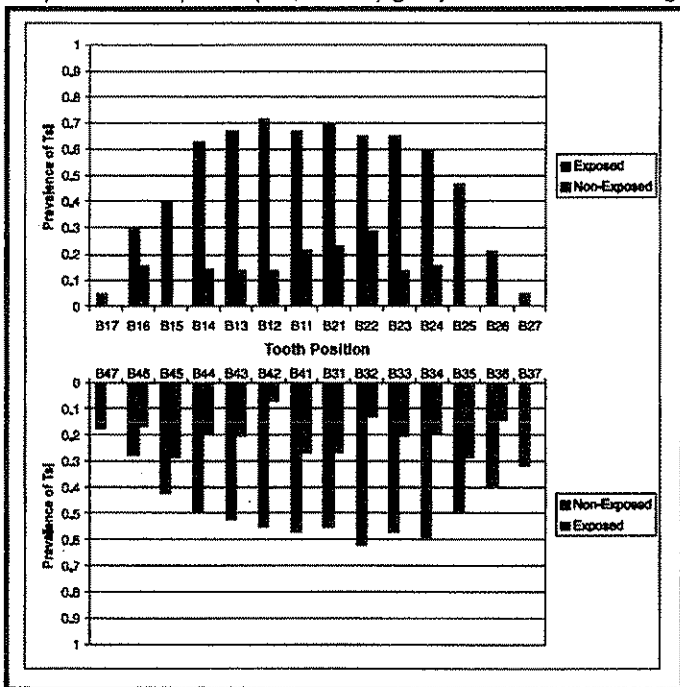


Figure 1. Tooth surface loss on buccal surfaces

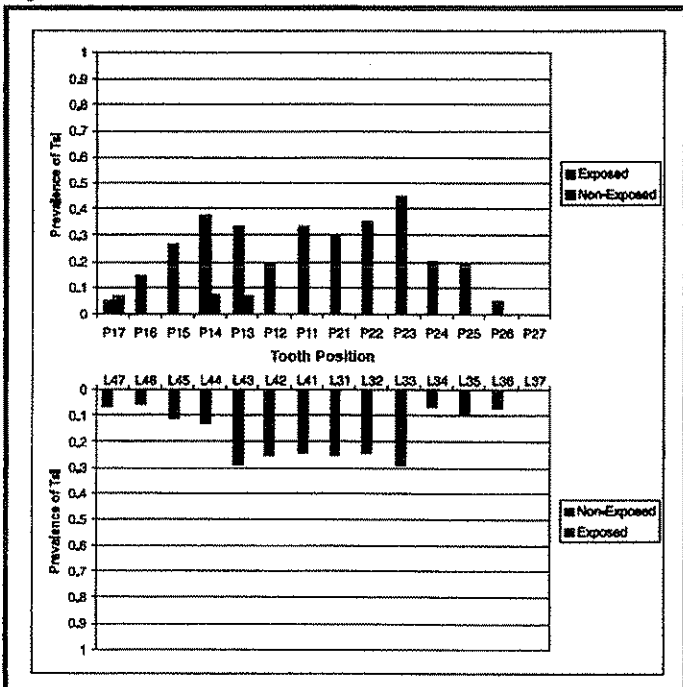


Figure 2. Tooth surface loss on palatal and lingual surfaces

according to the Wilcoxon test. The lack of difference between these groups is likely due to sample size restrictions. The average stain score of the eighteen exposed males was more than twice that found in the female non-exposed group, though this difference was not significant ($p = 0.06$). Positive Pearson correlations were calculated for stain score and Tsl ($p < 0.05$).

Patterns of Tooth Surface Loss

All individuals in three (male exposed, male non-exposed and female exposed) of the four groups displayed some form of tooth surface loss. Only some of the individuals in the female non-exposed group were clinically diagnosed with tooth surface loss. The prevalence and patterns of tooth surface loss for the different teeth and surfaces of the four groups are presented graphically and illustrate tooth surface loss for the various surfaces per individual tooth. The Y-axis represents the prevalence of Tsl expressed as a proportion of the teeth scored as grade 1, 2 or 3.

Figure 1

Patterns of tooth surface loss for the buccal surfaces of different teeth of the exposed and non-exposed subjects are illustrated in Figure 1. The prevalence of buccal tooth surface loss in the maxillary teeth for the exposed group is low in the posterior teeth and increases progressively to 0.7 in the anterior teeth. The mandibular teeth have a higher prevalence of Tsl for the posterior teeth than the maxillary teeth. Generally for the two jaws, the pattern is similar in that more anterior teeth are affected than posterior ones.

The prevalence pattern in the mandibular teeth is slightly less symmetrical than that of the maxillary teeth. Tsl is also relatively less for the anterior mandibular teeth.

The patterns of Tsl on the buccal surfaces of the mandibular teeth in the non-exposed group are firstly lower in prevalence and severity compared to the exposed group. Secondly, the strong kind of symmetry seen in the exposed groups is absent, although

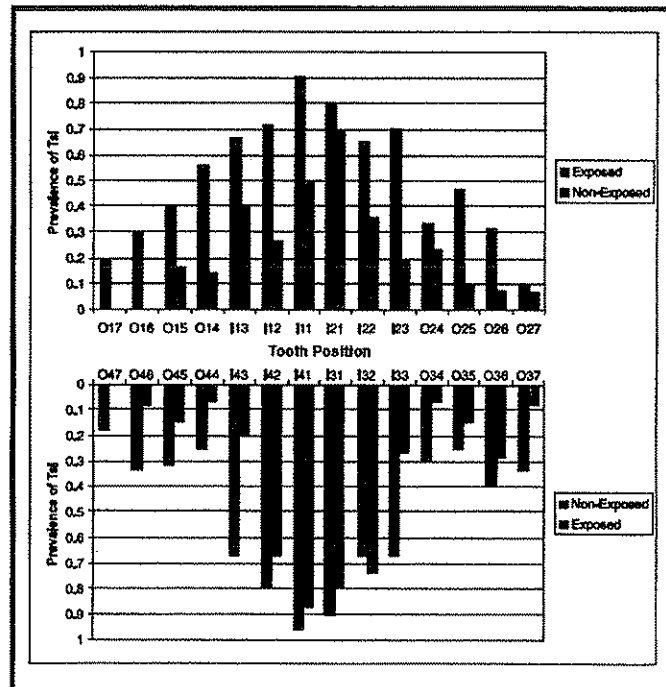


Figure 3. Tooth surface loss on occlusal or incisor surfaces

the Tsl on the lefthand side tends to be a mirror image of the Tsl on the right-hand side. The symmetry in this case is different between the exposed group and that for the non-exposed group. The anterior teeth do not manifest a progressive increase in Tsl from the posterior teeth, the central incisors are more affected than the laterals or canines. The second premolars are the most severely affected.

Figure 2

Patterns of tooth surface loss for the lingual and palatal surfaces of different teeth in the exposed and non-exposed group is illustrated in Figure 2. The prevalence of palatal Tsl is less than that of the buccal surfaces of the maxillary anterior teeth for the exposed group. The pattern of Tsl is not as symmetrical as with the buccal surfaces mentioned earlier. It also shows a drop in prevalence between anterior and posterior teeth. Tsl on the lingual surface in teeth of the lower jaw of the exposed group is different in that the posterior teeth have a low Tsl prevalence while the anterior teeth have a higher Tsl prevalence of between 0.2 and 0.4.

There appears to be a sustained discrete increase of Tsl between the premolars and the canines. The prevalence is less than the palatal surfaces of the exposed group for the maxillary teeth. The pattern of Tsl for the anterior teeth is also different. Whereas the pattern of Tsl on the lingual surface of the lower jaw forms a plateau, the pattern on the palatal surface fluctuates.

Hardly any erosion was observed on the palatal surfaces in teeth of the upper jaw of the non-exposed group, which is in complete contrast to the Tsl of the palatal surfaces in the exposed group. No tooth surface loss was recorded on the lingual surface of the lower jaw, which is in stark contrast to the exposed group.

Figure 3

Patterns of tooth surface loss for the occlusal /incisor surfaces of different teeth for the exposed and non-exposed groups are illustrated in Figure 3. A linear increase of the prevalence of Tsl is seen with the occlusal surfaces from the posterior to the anterior teeth and it reaches a maximum of more than 0.8. This symmetrical linear increase is different from the progressive increase seen in the buccal surfaces of the maxillary teeth. The average prevalence of the Tsl on the anterior incisor surfaces is 0.69 and that of the buccal surfaces of the exposed maxillary anterior teeth is 0.67.

A very distinct pattern is seen with Tsl on the occlusal /incisor surfaces in teeth of the lower jaw of the exposed group. There is a clear divide between the prevalence of the posterior teeth and that of the anterior teeth. There is a discrete jump in the Tsl from premolar teeth to the canine teeth. The central plateau is different from the plateau observed with the lingual exposed group. The plateau in the case of the lingual surfaces is concave whereas in this instance it is convex.

Tooth surface loss on the occlusal / incisor surfaces in teeth of the upper jaw of the non-exposed group shows a weaker linear increase towards the anterior teeth than in the exposed group. The average prevalence of the central incisors is approximately 0.6 compared to 0.85 for the exposed group. Overall, the prevalence is also less than that of the exposed group.

Tooth surface loss on the occlusal /incisor surfaces in teeth of the lower jaw in the non-exposed group shows a pattern and prevalence of Tsl that is different from that of the exposed group, in that the canines do not form part of the plateau for the non-exposed group.

The prevalence of Tsl in centrals and laterals (0.77) is slightly lower than that of the exposed group (0.83).

Table 1

Summaries of the descriptive statistics of tooth surface loss for the different grades of Tsl are tabulated according to gender and group (exposed/ non-exposed). Due to extensive standard deviations (some more than the mean) and skewness, usual statistical tests for means or medians were abandoned.

Descriptive statistics of tooth surface loss as was measured by SumSurf123 (the sum of scores for Grades 1, 2 & 3). Among the males there is a notable difference in tooth surface loss between the exposed and non-exposed group. Tooth surface loss was experienced two and a half times more in the former than in the latter. The reverse trend was found in the females.

An analysis was also made of tooth surface loss as measured by SumSurf23 (the sum of scores for Grades 2 & 3, the more severe grades) according to gender and group (exposed/ non-exposed). The average score in the male exposed group was twice that of the non-exposed males ($p < 0.05$). Generally, the severity of Tsl was lower in the females. There was no Tsl recorded in the exposed female group.

The descriptive statistics of tooth surface loss as measured by WghtdSumSurf (Grades 2 and 3 were weighted in respect of the severity and added to the number of Grade 1 surfaces) according to gender and group (exposed/ non-exposed) to stress the more severe scores in the groups. For the exposed male group, this measure had a remarkably high average of 52.5 (sd 30.3).

The results for the non-exposed male and female groups were similar and therefore the results of the weighted sum of the non-exposed male and female groups were combined for the purpose of descriptive statistics. The average weighted Tsl measure of this combined group was 16.8 (sd 18.0), more than 3 times lower than the exposed male group.

DISCUSSION

The aim of the study was to assess and compare the patterns, prevalence and severity of tooth surface loss in a cross sectional comparative study between winemakers (exposed) and adults not in the wine industry (non-exposed). Oral hygiene in

Table 1: Descriptive Statistics on Tooth Surface Loss

GROUP		Gender		
		Male	Female	Total
Exposed	Count	16	1	17
	Mean	1.05	0.5	0.77
	Standard Deviation	0.25	0.27	0.26
	Maximum	3	2	3
Non-Exposed	Count	12	0	12
	Mean	0.67	0	0.33
	Standard Deviation	0.51	0	0.33
	Maximum	3	0	3

both groups was on a reasonable standard, although the females demonstrated a higher degree of brushing. Tooth brushing, though, may contribute to tooth surface loss and brushing immediately after wine tasting should be avoided. Brushing after exposure to the wine or acids will result in a greater loss of tooth substance due to the "pre-softening" of the surface before the application of mechanical forces.^{15,16} Tooth brushing without toothpaste, after an erosive challenge, showed deposition of salivary components, inducing demineralisation, while brushing with non-fluoridated toothpaste resulted in abrasion.¹⁷ Fluoride toothpaste has been shown in vitro to have a positive effect in the presence of erosive challenges from dietary sources and from EDTA, often used in oral hygiene products.¹⁸ It has been shown in vitro that even topical fluoride treatment, prior to acid exposure, will reduce erosive effects.¹⁹

Patterns of tooth surface loss

No tooth surface loss was recorded on the lingual surface for the non-exposed group of the lower jaw, which is in stark contrast to the exposed group. It is interesting to note that for all the other surfaces of the non-exposed group, there was some form of erosion - whilst this is not the case for the lingual surfaces of the non-exposed group. However, the non-exposed people also drank wine. The difference is that the exposed group taste wine as part of their occupation, and the other group does not. It would seem that erosion in this case is not a sequel to drinking wine in general (social drinking). It would appear from the comparison of the exposed and non-exposed groups for this surface (lingual), that the exposure to wine tasting is the most likely cause of this effect. It is possible that the submandibular salivary gland secretions are able to resist the insult of acidic drinks with wine drinking in general but the capacity of these secretions to combat erosion is exceeded with frequent wine tastings.

A possible reason for the low prevalence of erosion generally on the posterior maxillary labial surfaces and the lingual surfaces may be due to the proximity of the major salivary ducts discharging saliva in the vicinity of these tooth surfaces. Major salivary glands are usually divided into the symmetrically paired parotid, submandibular, and sublingual glands.²⁰ Minor salivary glands are found on the hard and soft palate, in the lips and oro-pharynx. Saliva is discharged from the major glands into the oral cavity

via Stenson's duct, Wharton's duct and numerous small orifices in the floor of the mouth, respectively. Normal volume of salivary secretion in an adult male varies from 1000-1500 ml/24 hour.²⁰ The parotid and submandibular glands secrete a serous fluid. Ions present in saliva include sodium, potassium, calcium, magnesium, phosphate and bicarbonate.²¹ Saliva is supersaturated with calcium phosphate, which in theory prevents demineralisation of teeth.²¹ The pH is in the range of 6.2-8.0.²¹

Descriptive statistics of Tsl scores

Prevalence of Tsl occurred two and a half times more in the male exposed group compared to the non-exposed group. The reverse trend was found in the females, which may be due to age differences (exposed females: 29 years; non-exposed females 41 years), short employment period of the exposed group and possibly lesser exposure to wine tasting. The severity of Tsl (scores 2 and 3) in the male exposed group was twice that of the non-exposed males with females experiencing a lower severity.

The prevalence of Tsl was significantly greater in the exposed group than in the non-exposed group. The largest occurrence of Tsl occurred on the labial and incisal surfaces of anterior teeth for the exposed groups. The location of erosion mostly on the labial surfaces of anterior teeth is in agreement with other studies.^{8,22} A possible explanation for this epidemiological observation is the experimental evidence of Britse & Lagerhof²³ and Bashir, Gustavsson and Lagerhof.²⁴ The former shows that with rinsing, the retention is much longer in the maxillary labial region and the latter, that clearance time for solutions is longer from the maxillary incisor region than from the mandibular region.

CONCLUSION

In this study it was possible to show that there was a difference in terms of the prevalence and severity of tooth surface loss between teeth of winemakers and those who are not winemakers. The occurrence of tooth surface loss among winemakers was highly likely due to frequent exposure of their teeth to wine. Frequent exposure of the teeth to wine, as occurs among wine tasters, is deleterious to enamel, and constitutes an occupational hazard. Erosion is an occupational risk for wine tasters. Studies on the epidemiology of dental health in the winemaking industry,

pathogenesis of erosion and protective strategies to combat dental erosion due to frequent exposure of individuals to wines are recommended.

REFERENCES

1. Armstrong, GO. Lambrechts, MG. Mansvelt, EPG. Van Velden, DO. Pretorius, IS. Wine and Health. South African Journal of Science 2001;97:279-82.
2. Schuur, AH. Abraham-Inpijn, L. Van Straalen, JP. Sastrowijoto, SH. An Unusual Case of Black Teeth. Oral Surg Oral Med Oral Pathol 1987; 64(4):427-31.
3. Ferguson, MM. Dunbar, RJ. Smith, JA. Wall, JG. Enamel Erosion Related to Winemaking. Occup Med Lond 1996; 46(2):159-62.
4. Hede, B. Determinants of Oral Health in a Group of Danish Alcoholics. Eur J Oral Sci 1996; 104:403-8.
5. Chaudhry, St. Harris, JL. Challacombe, SJ. Dental Erosion in a Wine Merchant: An Occupational Hazard? Br Dent J 1997; 182 (6):226-8.
6. McIntyre, JM. Erosion. Aust Prost J 1992; 6:17-25.
7. Georgiou, R. A Review of the Dental Effects of Regular Wine Tasting. Wine Industry J 1997; 12 (3):294-5.
8. Wiktorsson, AM. Zimmerman, M. Angmar-Mansson, B. Erosive Tooth Wear: Prevalence and Severity in Swedish Winetasters. Eur J Oral Sci 1997; 105(6):544-550.
9. Eccles, JD. Erosions Affecting the Palatal Surfaces of Upper Anterior in Young People. Br Dent J 1982; 152:375-378.
10. Grobler, SR. Jenkins, GN. Kotze, D. The Effects of the Composition and Method of Drinking of Soft Drinks on Plaque pH. Br Dent J 1985; 158:293-6.

The rest of this article's references (11-24) will be published in the online SADJ. www.sada.co.za

NOTICE

REQUEST FOR A SHOW OF INTEREST-SADA CONGRESS COMMITTEE

The National Council of SADA hereby requests persons who wish to serve on a soon to be established SADA in-house Congress Committee to indicate their interest by contacting the CEO before 21st October by fax (011-642-5718) or e-mail (neilc@sada.co.za).

Persons with special interest in, or knowledge of, congress organisation, who are prepared to serve on an exciting new committee, would be ideal candidates. SADA offers no special remuneration at this point in time but, should the concept be successful, this aspect could be reconsidered.

Colleagues who wish to improve the lot of the profession via exciting new congress concepts please consider making yourself available. The first meeting of the new committee is scheduled for 31 October at 10.00H.

Neil Campbell CEO