# Prevalence of pathological tooth wear in patients with chronic alcoholism

**N. D. Robb,** BDS, FDS
*The Dental School, Framlington Place, Newcastle upon Tyne NE2 4BW*

**B. G. N. Smith,** PhD, MSc, BDS, FDS
*Department of Conservative Dentistry, UMDS, Guy's Hospital, London SE1 9RT*

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**Although chronic alcoholism is a very common condition, with potentially harmful consequences for the sufferer, there has been little emphasis in the literature on its effects on the teeth. This study of 37 alcoholic patients showed that their teeth had significantly more wear than age and sex matched controls. The tooth wear was most marked in males, and those whose alcohol consumption was continuous rather than in the form of episodic binges. The wear appeared to be erosive in nature, and in 40% of the sample it affected the palatal surfaces of the upper anterior teeth. It is therefore suggested that general dental practitioners should bear in mind the possibility of chronic alcoholism in cases of unexplained dental erosion.**

Chronic alcoholism is a serious condition, with many potentially life-threatening complications.[1] These include liver cirrhosis, neurological disorders, such as Wernicke-Korsakoff syndrome and peripheral neuropathy, interactions with other drugs, malnutrition, aggravation of pre-existing cardiovascular disease and mental disorders, such as alcohol psychoses and affective disorders.[1-3] Alcohol causes severe irritation of the mucosa of the stomach and duodenum, which is worse in alcoholics than non-alcoholics.[4]

Chronic alcoholism is thought to affect about 10% of the adult population.[2,5] The cost implications, both in terms of the medical management and the time lost from employment are large, having been estimated at £43 billion in the USA in 1975.[6]

Changes in the oral tissues can help in the diagnosis of many disorders.[7] This is also true of alcoholism, where enlargement of the parotid glands[8] and attrition (tooth wear caused by physical contact of one tooth with another)[9] have been reported. Patients with a history of excessive alcohol consumption have been shown to have pathological levels of tooth wear which looks more like erosion (the loss of enamel and dentine due to chemical attack, other than acids produced by bacteria) rather than attrition.[10] The current study was undertaken to assess the prevalence of pathological tooth wear in a population of chronic alcoholic patients.

## Materials and methods

In-patients admitted for the treatment of chronic alcoholism were seen at the Maudsley Hospital, London and Warlingham Park Hospital, Surrey. The psychiatric diagnosis had already been established by the physicians in charge of the patients' care. Criteria for inclusion in the study were a willingness to participate and a minimum of 12 scoreable permanent teeth.

The patients were all seen by the same examiner, and detailed histories of the factors known to be involved in the aetiology of tooth wear were taken under the headings shown in Table I. A 'Tooth Wear Index'[11] was recorded, scoring

**Table I** Factors in the history of tooth wear

| |
|---|
| Diet |
| Digestive disorders |
| Oral hygiene practices |
| Habits (eg bruxism, nail biting) |
| Past medical and dental history |
| Present medical and dental history |

cervical, buccal, occlusal, and lingual surfaces of all standing permanent teeth, giving a maximum of 128 surfaces per dentition. Missing, restored and unscoreable surfaces were also recorded, as was Angles Classification, quality of posterior support, and the ease of movement in lateral and protrusive excursions.

The raw data were analysed using a specially written computer programme to produce pathological tooth wear levels and also mean pathological wear profiles for different groups of sites.[11]

A control group of healthy individuals were used for comparison. The control group were selected from a separate study of 1000 dental attenders from 102 dental practices in the South East of England. The control for each alcoholic subject was selected on a best match basis for age, sex, social class, according to occupation and number of standing teeth. Individuals with a history of alcoholism or prolonged excessive alcohol consumption were excluded prior to the matching process. Similar histories and examinations were carried out by the same examiner, and the data handled in the same way. This method was used in a previous study of individuals suffering from anorexia and bulimia nervosa.[12]

The total number of sites scored and the number rated as pathological were calculated. The differences between the groups were analysed using a test to determine the significance of the differences between proportions.

## Results

The mean ages and number of sites scored per patient in the alcoholic and control groups are shown in Table II. The groups are comparable by these criteria.

**Table II** A comparison of the experimental and control groups

| | Mean age in years (range) | Mean number of surfaces scored (range) | Mean number pathologically worn (range) | Total % pathol wear | Number of individuals with upper palatal pathol wear (%) | Number of individuals with no pathological wear (%) |
|---|---|---|---|---|---|---|
| Alcoholic | 38·4 (23–65) | 91·7 (43–128) | 9·01 (0–51) | 9·85 | 15 (40·5) | 3 (8·1) |
| Control | 39·6 (25–63) | 98·1 (56–128) | 1·8 (0–6) | 1·82[a] | 3[b] (8·1) | 13[b] (35·1) |

[a] $P<0·001$
[b] $P<0·01$

**Table III** Number of subjects divided by the percentage of pathologically worn sites

| Percentage of sites affected by pathological tooth wear | Control group | Alcoholic group |
|---|---|---|
| 0 | 13 | 3 |
| 0·1–5·0 | 21 | 16 |
| 5·1–10·0 | 3 | 5 |
| 10·1–15·0 | 0 | 4 |
| 15·1–20·0 | 0 | 1 |
| 20·1–25·0 | 0 | 3 |
| >30 | 0 | 5 |
| | 37 | 37 |

**Table IV** Difference in wear between males and females

| | Number of subjects | Total sites scored | Number of sites pathologically worn | % Pathologically worn |
|---|---|---|---|---|
| Alcoholic | | | | |
| male | 25 | 2228 | 248 | 11·11 |
| female | 12 | 1164 | 86 | 7·39[a] |
| Control | | | | |
| male | 25 | 2426 | 51 | 2·10 |
| female | 12 | 1205 | 15 | 1·30[b] |

[a] $P<0·001$
[b] N/S

**Table V** Difference in wear between continuous and binge drinkers, and those with and without morning retching and vomiting

| | Number of subjects | Total sites recorded | Number of sites pathologically worn | % Pathologically worn |
|---|---|---|---|---|
| Continuous drinkers | 19 | 1719 | 195 | 11·34[c] |
| Binge | 16 (a) | 1524 | 95 | 6·23 |
| Vomiters | 22 | 2133 | 149 | 6·98 |
| Non-vomiters | 12 (b) | 880 | 52 | 5·91[d] |

[a] Two subjects not recorded
[b] Three subjects not recorded
[c] $P<0·001$
[d] N/S

### *The prevalence of pathological tooth wear*

Table II shows the differences between the experimental and the control groups. The alcoholic group had significantly more pathologically worn sites than the control group ($P<0·001$). Table II also shows the number of patients with pathological wear of the palatal surfaces of the upper anterior teeth, one of the features of a 'regurgitation erosion' pattern of wear,[13] and the number of individuals with no pathological tooth wear. The pathological wear was not spread evenly between the subjects in the alcoholic group, as can be seen from Table III. It was not possible, from the histories given, to explain why some patients were affected more than others.

When the experimental group was divided by sex (Table IV) the males had significantly more pathologically worn sites than the females. This difference was not found to be significant in the control group.

The sample of alcoholics was also divided into those who drank regularly and those who binge drank, ie drinking large amounts of alcohol in phases lasting up to 1–2 weeks and then have dry periods in between, and those who complained of nausea and vomiting in the morning and those who did not (Table V).

The typical clinical appearance of the tooth wear in this group has already been described,[10] and a case is shown (fig. 1).

## Discussion

The majority of these patients showed a predominance of *smooth* surface wear, suggesting that erosion is the most likely cause, although the exact nature of this process has yet to be determined. It is, however, possible that it was caused either

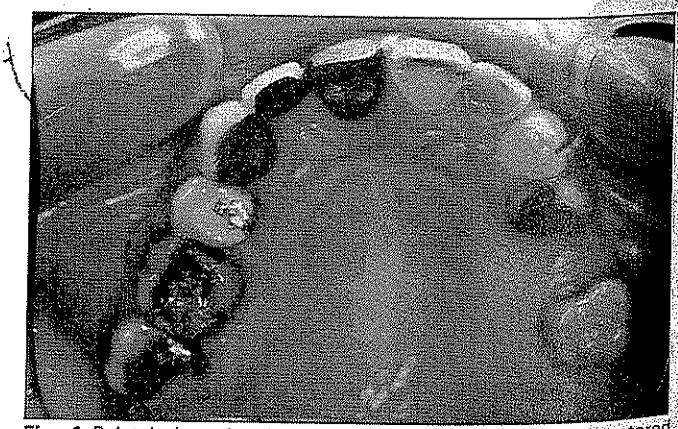

**Fig. 1** Palatal view showing typical erosive wear on the unrestored palatal surfaces of 3 2 1 (13, 12, 11).

the acid in the beverages or, more likely, from a subclinical regurgitation due to the chronic gastritis which is known to be produced by the ingestion of large amounts of alcohol. The latter is more probable, as 40% of the alcoholic patients had a large amount of wear palatally in the upper incisor region, a pattern which is typical of patients who are known to vomit or regurgitate regularly.

Chronic alcoholism is a condition which still carries a large social stigma, and most patients are secretive about it. It is therefore possible that the general dental practitioner may be the first person to suspect that an individual is suffering from chronic alcoholism on the evidence of unexplained dental erosion.

## Conclusions

The experimental group showed significantly more pathological tooth wear than the controls, and there was significantly more pathological wear in continuous drinkers than in binge drinkers, and in male alcoholics than in female alcoholics.

There was no difference between those alcoholics who reported feelings of nausea and vomiting in the morning and those who did not, although the clinical appearance of the wear was the same as regurgitation erosion. In view of the high prevalence of alcohol abuse in the general population, the possibility of chronic alcoholism should be borne in mind when seeing patients with tooth wear problems, particularly when it affects the palatal surfaces of the upper anterior teeth. Further work is needed to establish why some individuals are affected to a much greater extent than others.

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