RESEARCH SUMMARY

Tooth wear and dental erosion and their relationship with fluoridation and social deprivation

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 **P. F. Bardsley, S. Taylor and A. Milosevic**

Br Dent J 2004; 197: 413–416

Objective

The effect of water fluoridation upon dental erosion/tooth wear in the UK has not been investigated. This study aimed to compare the prevalence of tooth wear in 14–year-old schoolchildren in non-fluoridated and fluoridated districts of North West (NW) England. The influence of deprivation and tooth brushing was also investigated.

Design

A random sample of 10% of the 14-year-old population in NW England was selected and stratified according to fluoridation status as determined from water authority postcode listings.

Methods

Tooth wear was scored on the labial, incisal and palatal/lingual surfaces of the 12 anterior teeth and the occlusal surfaces of the first molars. Enamel wear was scored 0, dentine was scored 1 or 2, dependent on whether less than or more than a third of the surface had exposed dentine. Secondary dentine or pulpal exposure scored 3. Townsend deprivation scores were gained from residential post codes.

Results

A total of 2,351 children were examined, of which 637 (27%) lived in the one fluoridated district of South Cheshire and 1,714 (73%) lived in 11 non-fluoridated districts. Fifty-three per cent of the children had exposed dentine with significantly more males affected than females ($p<0.001$). In the fluoridated district, significantly fewer children had exposed dentine on labial and palatal smooth surfaces ($p<0.001$) but no differences were found for incisal and occlusal surfaces. The interaction of fluoridation and tooth brushing twice per day resulted in a significant (30%) reduction in erosion. Smooth surface wear was more prevalent in children resident in affluent areas.

Conclusion

Children in non-fluoridated districts are 1.5 times more likely to have smooth surface wear compared with children in fluoridated districts. Fluoridation and use of fluoridated toothpaste twice a day provide added protection from dental erosion. The risk of tooth wear is greater with increasing affluence.

IN BRIEF

- This is the first study to show that water fluoridation protects from dental erosion/toothwear in 14-year-old children.
- The benefits of water fluoridation as a public health measure is strengthened.
- This particular study shows that dental erosion/toothwear is a 'disorder of affluence'.

COMMENT

Water fluoridation is an effective and safe method by which the caries experience of entire populations can be reduced. Unfortunately, progress has been slow in extending community fluoridation in the United Kingdom and at present the only major schemes are in the West Midlands and the North West of England. New legislation may help the decision-making process and the paper by Bardsley *et al.* provides useful additional evidence to those involved in the implementation of water fluoridation schemes. The case is so well made that the caries-prevention effect of water fluoridation is at its most valuable amongst socially deprived subjects that it requires no re-statement. However, the present study provides new evidence for the benefits of water fluoridation upon tooth wear, a dental problem which until recently was under-reported and insufficiently understood. The finding that water fluoridation decreases the risk of smooth surface tooth wear by a factor of 1.5 is most encouraging, particularly in association with the finding that the protective effect is greatest on the smooth surfaces of the teeth, since these are the surfaces most prone to erosion.

Also of great interest in this study is the finding of a significant interaction between water fluoridation and regular tooth brushing with fluoridated toothpaste.

Whilst the experience of dental caries increases with social deprivation, the chance of suffering from erosion is increased amongst more affluent children, although the authors point out that whether dental erosion is a disorder of affluence remains unclear. What is clear is that tooth erosion is a serious dental condition that may be increasing in prevalence due to the changing eating and drinking habits of teenagers and young adults.

The fact that water fluoridation can reduce the prevalence of erosion is an important finding, particularly at the present time when the decision-making process has been clarified concerning the implementation of possible new schemes.

W. P. Rock
School of Dentistry, University of Birmingham
doi:10.1038/sj.bdj.4811719