Evidence-Based Dentistry (2002) 3, 41 – 42

www.nature.com/ebd

summary

Some evidence that water fluoridation reduces inequalities in dental health across social classes

McDonagh M, Whiting P, Bradley M, Cooper J, Sutton A, Chestnutt I, Misso K, Wilson P, and Kleijnen J. A Systematic Review of Public Water Fluoridation. York: University of York Publications Office, NHS Centre for Reviews and Dissemination. ISBN 1 900640 16 3. September 2000

Objective Does water fluoridation result in a reduction of caries across social groups and between geographical locations, bringing equity?

Data sources See page 37.

Study selection A total of 15 studies investigating the association of water fluoridation, dental caries and social class were identified, ranging in publication dates from 1969–1999. Among these were three unpublished studies (Holdcroft 1999, Gray 2000, Jones 2000).

Data extraction and synthesis All except two of the studies investigating the association between caries experience, water fluoridation and social class were of evidence level C. The only exceptions were the before–after studies, which were level B.

Conclusions The small quantity of studies, differences between these studies, and their low quality-rating, suggest caution should be applied in interpreting the results. There appears to be some evidence that water fluoridation reduces the inequalities in dental health across social classes in 5- and 12-year-olds, using the DMFT measure. This effect was not seen in the proportion of caries-free children among 5-year-olds. There were not sufficient data for the effects in children of other ages to be investigated fully.

Evidence-Based Dentistry (2002) **3,** 41 – 42. doi:10.1038/sj.ebd.6400102

Address for reprints: Publications Department, NHS Centre for Reviews and Dissemination, University of York, Heslington, York YO10 5BB.

Commentary

It is a well-established fact that in industrialised countries caries is more common in deprived than well-off people.[1] The same is true for people in deprived and well-off areas.[2] The mechanisms that link poor social status to an elevated risk of caries are not fully understood, but behavioural factors are known to be important. One would expect water fluoridation to reduce the differences in caries between social groups, as fluoridated water reaches even the people who are not exposed to any other means of caries prevention. In addition, the effect of any preventive measure is usually strongest in the people who have the highest risk of developing disease.

It is not surprising, however, that the evidence gathered to date on the potential of water fluoridation to reduce inequalities in dental health across social classes is inconsistent. Secular trends in the occurrence of caries and its risk factors influence the relative effect of preventive measures, including water fluoridation.[3] This might well be true for the effect of reducing the social inequalities as well. The impact of belonging to a particular social stratum is likely to be different in different countries and also likely to change with time within a country. Even the criteria for stratification of people into social classes vary. The situation of a person or an area that is considered deprived may be very different in different countries and at different times. The ability of water fluoridation to reduce inequalities in dental health may be different in different circumstances. It is unlikely that there is a universally applicable answer to the question that the systematic review attempts to settle.

The repeated surveys comparing caries in the primary dentition of 5-year-old lifelong residents of Newcastle and Northumberland offer the possibility of observing the issue over a longer period of time. In 1976, the answer seemed clear: in the fluoridated area, the mean DMFT value was lowest in children who belonged to the lowest social classes, whereas in the low-fluoride area the mean DMFT was higher the lower the social class.[4] It appeared that water fluoridation could have entirely removed social inequalities in caries occurrence. The effect was most probably overestimated. In the subsequent three surveys of 1981,[5] 1987[6] and 1994,[7] the mean DMFT value was lowest in the highest social classes even in the fluoridated area, although the differences were small. According to the latter results water fluoridation could reduce the inequalities in DMFT in 5-year-olds but not remove them. This is in accordance with the results of a huge Australian study of 5–12- and 5–15-year-olds.[8] The main conclusion of the systematic review seems accurate: caution is needed in interpreting the results of the existing literature. If the equity-

bringing effect of water fluoridation was strong, it would probably be apparent despite the flaws in the reported studies. At the moment one should not rely on water fluoridation as the only means of bringing about equity in dental health.

1. Watt R, Sheiham A. Inequalities in oral health: a review of the evidence and recommendations for action. Br Dent J 1999; 187:6–12.
2. Locker D. Deprivation and oral health: a review. Community Dent Oral Epidemiol 2000; 28:161–169.
3. Horowitz HS. The effectiveness of community water fluoridation in the United States. J Publ Health Dent 1996; 56:253–258.
4. Carmichael CL, Rugg-Gunn AJ, French AD, Cranage JD. The effect of fluoridation upon the relationship between caries experience and social class in 5-year-old children in Newcastle and Northumberland. Br Dent J 1980; 149:163–167.
5. Carmichael CL, French AD, Rugg-Gunn AJ, Furness JA. The relationship between social class and caries experience in five-year-old children in Newcastle and Northumberland after twelve years' fluoridation. Community Dent Health 1984; 1:47–54.
6. Carmichael CL, Rugg-Gunn AJ, Ferrell RS. The relationship between fluoridation, social class and caries experience in 5-year-old children in Newcastle and Northumberland in 1987. Br Dent J 1989; 167:57–61.
7. Evans DJ, Rugg-Gunn AJ, Tabari ED, Butler T. The effect of fluoridation and social class on caries experience in 5-year-old Newcastle children in 1994 compared with results over the previous 18 years. Community Dent Health 1996; 13:5–10.
8. Slade GD, Spencer AJ, Davies MJ, Stewart JF. Influence of exposure to fluoridated water on socioeconomic inequalities in children's caries experience. Community Dent Oral Epidemiol 1996; 24:89–100.

Hannu W Hausen
Institute of Dentistry, University of Oulu, Oulu, Finland