

# A prevalence study of dental fluorosis in infancy

*Dental fluorosis in permanent incisor teeth in relation to water fluoridation, social deprivation and toothpaste use in infancy* by E. D. Tabari, R. Ellwood, A. J. Rugg-Gunn, D. J. Evans, and R. M. Davies *Br Dent J* 2000; 189: 216-220

## Objectives

To determine the prevalence and severity of fluorosis in permanent incisor teeth in young children in a fluoridated and a fluoride-deficient community and to establish what relationship, if any, there was between the occurrence of dental fluorosis and the reported use of fluoride toothpaste in childhood.

## Design

A prevalence study of children aged 8–9 years who had been continuous residents in fluoridated Newcastle or fluoride-deficient Northumberland.

## Method

The permanent maxillary central incisor teeth were examined clinically and photographically by one examiner using the Thylstrup-Fejerskov index; the photographs were read blind to child identity and clinical score. A closed-response questionnaire enquired into the child's early experiences of toothbrushing and use of fluoride toothpastes. Social deprivation was measured by a Jarman score. The study took place in 1998.

## Outcome measure

Prevalence of dental fluorosis measured by the Thylstrup-Fejerskov index.

## Results

Complete data were available for 78% ( $n = 409$ ) and 79% ( $n = 403$ ) of eligible sampled children in the two areas, respectively. Clinical and photographic results agreed closely and had high reproducibility. The prevalence of fluorosis was 54% in the fluoridated area and 23% in the fluoride-deficient area when all

grades ( $> 0$ ) of fluorosis were included; percentage prevalence of mild to moderate fluorosis ( $\geq 3$ ) was 3% and 0.5% in the two areas, respectively. Multivariate analysis indicated that area of residence (odds ratio = 4.5), Jarman score (odds ratio = 0.99 per Jarman unit) and type of toothpaste (odds ratio = 1.6) were statistically significantly related to presence or absence of fluorosis: the risk factors were — fluoridated area, affluence, and use of adult toothpaste.

## Conclusions and recommendations

The prevalence of aesthetically important dental fluorosis was low, although higher in the fluoridated area. Use of a child's toothpaste (with lower fluoride concentration) could decrease risk in a fluoridated area. Adherence to the guidelines published by the British Society of Paediatric Dentistry is recommended.

## In Brief

- Dental fluorosis is linked to fluoride ingestion in early childhood.
- Children in fluoridated Newcastle had more dental fluorosis than children in fluoride-low Northumberland, although the severity was so mild as to be aesthetically unimportant.
- Advising that young children begin toothbrushing with a children's toothpaste is probably sensible, as recommended in the British Society of Paediatric Dentistry's policy document on fluoride dietary supplements and fluoride toothpastes for children.

## Comment

Concern that the prevalence of dental fluorosis may be rising in both fluoridated and non-fluoridated communities has prompted a number of studies to assess the fluorosis risk associated with different fluoride delivery systems. Fluoride toothpastes are the most widely used form of fluoride and the benefits of their use are well known. However the use of fluoride toothpaste by very young children has been identified as a potential risk factor for fluorosis. The aim of this study was to determine the prevalence and severity of fluorosis on the permanent incisors of young children in a fluoridated and a non fluoridated community and to look for a possible relationship between fluorosis and the use of fluoride toothpaste in childhood. The study group consisted of 474 8–9-year-old children from fluoridated Newcastle upon Tyne and 375 subjects from fluoride deficient Northumberland. A questionnaire sought information concerning the

age at which toothbrushing began, along with frequency, type and quantity of toothpaste used. Parents were also asked to put the same amount of toothpaste onto a brush that they had used when they first brushed the child's teeth.

Fifty-four per cent of Newcastle children and 23% of Northumberland children had fluorosis on the maxillary central incisors according to the TF index. Sixty per cent of parents in both groups reported beginning to brush their children's teeth during the first year. No association was found between reported age of first brushing, or frequency of brushing, or amount of toothpaste used and TF scores. Newcastle children who used a children's toothpaste had less fluorosis than those who had used a family toothpaste. Children from deprived areas were at lower risk of developing fluorosis.

This study failed to replicate the findings from a number of others which have

demonstrated associations between fluorosis and age of first brushing, amount of paste used, type of toothpaste and frequency of brushing. As an explanation the authors suggest difficulties associated with retrospective studies, particularly concerning the vagueness of parental replies concerning the care of their children 8 years previously.

The authors conclude that parents should supervise toothbrushing by young children, use small amounts of fluoride toothpaste and encourage spitting out of slurry. The use of pastes with low concentrations of fluoride may be appropriate for children in fluoridated areas in order to minimise fluorosis risks, although they may convey reduced caries protection.

## Peter Rock

Senior Lecturer in Orthodontics, University of Birmingham School of Dentistry