

An investigation into the ingestion of fluoride from toothpaste by young children

Fluoride ingestion from toothpaste by young children E. M. Bentley, R. P. Ellwood, and R. M. Davies *Br Dent J* 1999; 186: 460-462

Objective

To investigate the reported and observed brushing habits of young children and their ingestion of fluoride from toothpaste.

Design

In 1997, a random sample of 50 children, aged 30 months, from three districts in the North West region of England, were visited at home.

Methods

The reported and observed toothbrushing behaviour was determined and the weight of toothpaste applied to the toothbrush was measured. The amount of fluoride retained in the mouth after brushing with either a 400 ppm F or 1,450 ppm F toothpaste was determined.

Results

All parents claimed that their children's teeth were being brushed with a fluoride toothpaste at least once daily. The mean amount of toothpaste applied on the brush was 0.36 g of which 0.27 g (72%) was retained in the mouth. The mean amount of fluoride ingested per brushing was 0.42 mg when using the 1,450 ppm F toothpaste and 0.10 mg when using the 400 ppm F toothpaste. Although most parents applied a small amount of toothpaste a small minority applied a large amount. If using the 400 ppm F toothpaste twice daily no children of average weight would have

exceeded ingestion of 0.05 mgF/kg body weight whereas 14 average weight children would have exceeded this value if using the 1450 ppm F toothpaste.

Conclusions

It is essential that parents of children aged less than 7 years apply a small (pea-sized) amount of fluoride toothpaste on the toothbrush and discourage swallowing.

In brief

- Fluoride toothpaste is a major contributor to oral health.
- A small proportion of young children may be using too much toothpaste.
- Practitioners should reinforce the message that a small (pea-sized) amount of fluoride toothpaste should be used for children under 7 years of age.

Comment

This is a small study, involving 50 young children who were observed on one occasion only, brushing their teeth at home. Nevertheless, the study makes some important points of public health significance. First, young children (aged 30 months) cannot spit out effectively. Mothers of 17 children reported that their child spat out toothpaste, but only 5 were observed to do so. Second, more than one-third of a gram of toothpaste was applied, on average, at each brushing. This is much more than 'a small pea sized amount of toothpaste'. Although this health education message has been included on toothpaste packaging for 10 years or more, it appears that the importance of using toothpaste sparingly in young children has not been fully appreciated by the mothers of the children in this study.

Third, the amount of toothpaste estimated to have been ingested in this study may

have been overestimated. Care was taken to ensure that toothpaste was not retained on the lips, face and hands of subjects; if this occurred the data for the subject was discarded. Apparently data on toothpaste usage was available for 49 children; only one subject was uncooperative and the sample discarded. The 49 children must have had superb manual dexterity not to get any paste on their lips, face and hands.

Fourthly, the potential daily dose of fluoride ingested was calculated assuming that tooth brushing occurred twice daily, although 22 out of the 50 children (44 per cent) were reported to brush once a day.

Bearing these comments in mind, the crucial point of the study concerns the amount of fluoride ingested. The mean amount of fluoride ingested by children using the children's paste (400 ppm F) was established to be 0.10 mg, compared with a mean estimate of 0.42 mg for those children

using the family toothpaste (1,450 ppm F). Half the children using the latter toothpaste would have ingested more than 0.05 mg F/Kg body weight which one previous study, cited in the references (ref. 16) has suggested is a threshold which should not be exceeded if fluorosis is to be avoided.

The conclusion to me is clear: no child aged 30 months should be using toothpaste containing 1,450 ppm fluoride.

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