

FLUORIDE

Racial/ethnic influences on fluorosis



BACKGROUND

A 9 percentage point increase in the prevalence of very mild or greater fluorosis was seen in children and adolescents age 6 to 19 years based on a comparison of data gathered from 1999 to 2002 and data gathered from 1986 to 1987. A higher prevalence of enamel fluorosis was shown in the National Health and Nutrition Examination Survey (NHANES) 1999-2002 among non-Hispanic blacks compared to non-Hispanic whites. It was hypothesized that certain racial/ethnic groups of US children may experience an enhanced effect of fluoridation compared to others. A review of the data was done to determine whether the effect of water fluoride level on enamel fluorosis differs among various racial/ethnic groups of children.

METHODS

The data were taken from the National Survey of Oral Health of US School Children 1986-1987. This dataset is a unique entity because it used a national probability sample of US schoolchildren and collected data on the children's time-specific fluoride exposures. It's the only nationwide dataset of US children that collected detailed information on fluoride exposure and enamel fluorosis. The prevalence of enamel fluorosis among children age 7 to 17 years old was documented, with associations between race/ethnicity and enamel fluorosis determined by logistic regression modeling after controlling for age, gender, water fluoridation, other sources of fluoride, and region of residence.

RESULTS

The estimated adjusted odds ratios for the presence of any degree of enamel fluorosis was 1.3 for non-Hispanic Black children, 0.9 for Hispanic children, and 0.8 for non-Hispanic other groups compared to non-Hispanic White children. No statistically significant difference between groups was present. Only other sources of fluoride and water fluoridation at 0.7 to 1.2 ppm were statistically significant.

Exposure to fluoridated water increased the odds of developing enamel fluorosis but water fluoridation at 0.7 to 1.2 ppm was the same for all the various groups. Hispanic children were at statistically significantly higher odds for developing enamel fluorosis at

a lower level of fluoridation, specifically, 0.3 to less than 0.7 ppm, compared to other Hispanic children exposed to fluoridation.

DISCUSSION

African-American children and children of other racial and ethnic groups experienced similar odds of developing enamel fluorosis. Racial or ethnic factors did not alter the effect of water fluoridation on enamel fluorosis. When researchers study enamel fluorosis, they should recognize that explanations other than race or ethnicity should be considered when fluorosis appears to be higher in certain groups.

Clinical Significance

A limitation of this study is the fact that the survey dataset used is 30 years old and may not reflect fluorosis patterns seen today. However, this dataset is the only one publicly available that measures both fluorosis and fluoride exposure in children. In addition, there are several factors that would result in a higher prevalence of enamel fluorosis over the past 30 years, such as measurement error caused by systematically classifying a higher proportion of enamel defects as enamel fluorosis. The analysis does rightfully suggest that lowering the optimal range of drinking water fluoridation to a single value of 0.7 ppm would not only protect against enamel fluorosis but also deliver that protection to all racial and ethnic groups of children. It's also important to track the effects of a lower exposure to fluoride to ensure that dental caries protection is still being delivered.

Arora S, Kumar JV, Moss ME: Does water fluoridation affect the prevalence of enamel fluorosis differently among racial and ethnic groups? *J Pub Health Dent* 78:95-99, 2018

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