Exposure to Natural Fluoride in Well Water and Hip Fracture: A Cohort Analysis in Finland.

Paivi Kurttio, Nils Gustavsson, Terttu Vartiainen, and Juha Pekkanen

ABSTRACT
In the retrospective cohort study based on record linkage, the authors studied a cohort of persons born in 1900--1930 (n =144,627), who had lived in the same rural location at least from 1967 to 1980. Estimates for fluoride concentrations (median, 0.1 mg/liter; maximum, 2.4 mg/liter) in well water of each member of the cohort were obtained by a weighted median smoothing method based on groundwater measurements. Information on hip fractures was obtained from the Hospital Discharge Registry for 1981--1994. No association was observed between fluoride concentration in the well water in either men or women when all age groups were analyzed together. However, the association was modified by age and sex so that among younger women, higher fluoride levels increased the risk of hip fractures. Among older men and women and younger men, no consistent association was seen. The adjusted rate ratio was 2.09 (95% confidence interval: 1.16, 3.76) for younger women who were the most exposed (>1.5 mg/liter) when compared to those who were the least exposed (<0.1 mg/liter). The results suggest that fluoride increases the risk of hip fractures only among women.

SUMMARY
Kurttio and colleagues studied over 144,000 elderly rural Finnish people admitted to hospitals with their first hip fracture, who lived at the same address from 1967 to 1980. They found that women aged 50-64 years old exposed to natural water fluoride levels greater than 1.5 mg/liter had significantly more hip fractures than similar women least exposed to fluoride at 0.1 mg/liter or less. "These results suggest that fluoride may be associated with some gender-dependent mechanisms or risk factors for hip fractures," report the research team. "The scientific evidence clearly shows that fluoride damages bone even at levels added to public drinking water," says Dr. John R. Lee, physician and authority on fluoride and its bone effects.