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Acute fluoride poisoning from a public water system.

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Abstract

BACKGROUND: Acute fluoride poisoning produces a clinical syndrome characterized by nausea, vomiting, diarrhea, abdominal pain, and paresthesias. In May 1992, excess fluoride in one of two public water systems serving a village in Alaska caused an outbreak of acute fluoride poisoning.

METHODS: We surveyed residents, measured their urinary fluoride concentrations, and analyzed their serum-chemistry profiles. A case of fluoride poisoning was defined as an illness consisting of nausea, vomiting, diarrhea, abdominal pain, or numbness or tingling of the face or extremities that began between May 21 and 23.

RESULTS: Among 47 residents studied who drank water obtained on May 21, 22, or 23 from the implicated well, 43 (91 percent) had an illness that met the case definition, as compared with only 6 of 21 residents (29 percent) who drank water obtained from the implicated well at other times and 2 of 94 residents (2 percent) served by the other water system. We estimated that 296 people were poisoned; 1 person died. Four to five days after the outbreak, 10 of the 25 case patients who were tested, but none of the 15 control subjects, had elevated urinary fluoride concentrations. The case patients had elevated serum fluoride concentrations and other abnormalities consistent with fluoride poisoning, such as elevated serum lactate dehydrogenase and aspartate aminotransferase concentrations. The fluoride concentration of a water sample from the implicated well was 150 mg per liter, and that of a sample from the other system was 1.1 mg per liter. Failure to monitor and respond appropriately to elevated fluoride concentrations, an unreliable control system, and a mechanism that allowed fluoride concentrate to enter the well led to this outbreak.

CONCLUSIONS: Inspection of public water systems and monitoring of fluoride concentrations are needed to prevent outbreaks of fluoride poisoning.

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