NITRATES IN DRINKING WATER AND THE RISK OF DEATH FROM CHILDHOOD BRAIN TUMORS IN TAIWAN

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Background and Aims: The objective of this study was to (1) examine the relationship between nitrate (NO3-N) levels in public water supplies and risk of death from childhood brain tumors (CBT) and (2) determine whether calcium (Ca) and magnesium (Mg) levels in drinking water might modify the effects of NO3-N on development of CBT.
Methods: A matched cancer case-control study was used to investigate the relationship between the risk of death attributed to CBT and exposure to NO3-N in drinking water in Taiwan. All CBT deaths of Taiwan residents from 1999 through 2008 were obtained from the Bureau of Vital Statistics of the Taiwan Provincial Department of Health. Controls were deaths from other causes and were pair-matched to the cases by gender, year-of-birth, and year-of-death. Information on the levels of nitrate-nitrogen (NO3-N), Ca and Mg in drinking water were collected from Taiwan Water Supply Corporation. The municipality of residence for CBT cases and controls was presumed to be the source of the subject's NO3-N, Ca, and Mg exposure via drinking water.
Results: Relative to individuals whose NO3-N exposure level was <0.31 ppm, the adjusted OR (95% CI) for CBT occurrence was 1.4 (1.07-1.84) for individuals who resided in municipalities served by drinking water with a NO3-N exposure > 0.31 ppm. No significant effect modification was observed by Ca and Mg intake via drinking water.
Conclusions: Data suggest that exposure to NO3-N in drinking water is associated with a higher risk of CBT development in Taiwan.