New research identifies link between drinking water disinfection byproducts and risk of colorectal cancer in men

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Results from a large population-based cohort study including 60,000 men and women in central Sweden suggest that exposure to higher

concentrations of disinfection byproducts in drinking water is associated with elevated risk of colorectal cancer in men.

Drinking water is a very important part of our diet that is consumed daily by essentially everyone in the population. Hence, assuring a that the public drinking water maintains a high standard is crucial. Chlorination of drinking water is a cheap and effective method widely used to control waterborne infectious disease. A drawback is, however, that reactive chemical byproducts can be formed in the drinking water, some of which have been proposed to cause cancer.

Trihalomethanes are the disinfection byproducts that are formed at the highest concentration in chlorinated drinking water. Several of these substances can damage DNA and cause tumors in the colon of rodents. Studies in humans are limited but some indications that trihalomethane exposure increases the risk of bladder and colorectal cancer exist.

In the study, which was recently published by the *JNCI: Journal of the National Cancer Institute*, 60,000 middle-age and elderly men and women with varying levels of disinfection byproducts in drinking water were followed for 22 years.

The results suggest that men with the highest exposure have a 20% increased risk of colorectal cancer overall and 60% increased risk of left sided colon cancer compared to unexposed men. In women no overall association was observed. Because many Swedish drinking water producers only use small amounts of chlorine in their production, these findings were observed at lower trihalomethane concentrations than in most previous research studies.

Colorectal cancer is the third most common malignancy globally and in Sweden, with about 6,000 newly diagnosed cases each year. It has a strong environmental component and established risk factors include

smoking, low physical activity, high intake of alcohol, red and processed meat and low intake of dietary fiber.

Together with the evidence from animal studies and previous epidemiological studies, the findings of this new study adds disinfection byproducts to the list of other possible environmental risk factors. Given that more efficient and chemical free disinfection methods exist today, exposure is preventable.

More information: Emilie Helte et al, Disinfection by-products in drinking water and risk of colorectal cancer: a population-based cohort study, *JNCI: Journal of the National Cancer Institute* (2023). DOI: 10.1093/jnci/djad145

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