

DISINFECTION BY-PRODUCTS AND COLORECTAL CANCER IN SPAIN

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Background and aims: Disinfection by-products (DBPs) are colorectal carcinogens in rodents exposed experimentally, but epidemiological evidence in humans is contradictory. A multi-case control study conducted in Spain (MCC-Spain) aims to evaluate the risk of colorectal cancer associated with long-term exposure to DBPs.

Methods: Incident cases 20-85 years old were enrolled and population-based controls were age- and gender-frequency matched to cases in Asturias, Barcelona, Gipuzkoa, León, Madrid, Murcia and Navarra. Study subjects were interviewed on residential history and water use (ingestion, showering, bathing, dishwashing and swimming in pools) and potential risk factors. Assessment of lifetime trihalomethane (THM) exposure is based on historical data on THM levels and determinants (water source and treatment) in the study municipalities.

Results: Among the 3762 study subjects included, water ingested at the longest residence (35 years on average) was mainly municipal water (65% cases, 75% controls), followed by bottled water (24% cases, 18% controls). Municipal water consumption at the longest residence, showering/bathing above the median (>35 min/week) and hand dishwashing above the median (>140 min/week) were not associated with colorectal cancer risk (odds ratios around 1 and not statistically significant). Stratified results by area showed consistent results. In a subset of Barcelona (488 cases, 422 controls), the study population was grouped in tertiles of lifetime residential THM concentration from age 16 years. Tertiles in $\mu\text{g/l}$ were 7.5, 21.5 (chloroform); 22.7, 31.5 (bromodichloromethane), 13.9, 26.9 (dibromochloromethane) and 16.5, 49.2 (bromoform). In a model adjusting for the 4 THMs simultaneously, a decreased risk for colorectal cancer was observed for chloroform, and an increased risk for bromodichloromethane, both with statistically significant dose-response trends. No significant associations were found for dibromochloromethane and bromoform.

Conclusions: Results based on the questionnaire show consistent results among areas, with null associations. Results for THM exposure differ widely among specific THMs and need replication in other study areas.