ABSTRACT

BACKGROUND: Increased risk of various congenital anomalies has been reported associated with trihalomethane (THM) exposure in the water supply.

OBJECTIVES: Registry-based study of relationship between THM concentrations and risk of congenital anomalies in England and Wales.

METHODS: We obtained congenital anomaly data from the National Congenital Anomalies System, regional registries and national terminations registry, and THM data from water companies. Total THM (<30, 30-<60, 60+ µg/l), total brominated (<10, 10-<20, 20+ µg/l) and bromoform exposure (<2, 2-<4, 4+ µg/l) were modelled at place of residence for the first trimester of pregnancy. We included 2,605,226 live and still births and terminations with 22,828 cases of congenital anomalies. Analyses using fixed and random effects models were done for broadly defined groups of anomalies (cleft palate/lip, abdominal wall, major cardiac, neural tube, urinary and respiratory defects), a more restricted set of anomalies with better ascertainment, and for isolated and multiple anomalies. Adjustment was done for sex, maternal age, socio-economic status.

RESULTS: There were no statistically significant trends across exposure categories for either the broadly defined or more restricted sets of anomalies. For the restricted set of anomalies with isolated defects, there were significant (p<0.05) excess risks in the highest exposure categories of total THMs for ventricular septal defects, OR=1.43 (95% CI 1.00-2.04) and of bromoform for major cardiovascular defects and gastroschisis, OR=1.18 (95% CI 1.00-1.39) and OR=1.38 (95% CI 1.00-1.92) respectively.

CONCLUSION: This large national study found little evidence for a relationship between THM concentrations in drinking water and risk of congenital anomalies.