

Exposure to Disinfection By-Products and Adverse Birth Outcomes Related to Fetal Growth and Prematurity – A Systematic Review and Meta-Analysis

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Abstracts: ISEE 21st Annual Conference, Dublin, Ireland, August 25-29, 2009: Poster Presentations

Abstract

Background and Objective

We aimed to provide quantitative estimates of exposure-response relationships between total trihalomethanes in drinking water and several adverse birth outcomes relating to fetal growth and prematurity, suitable for use in health impact/risk assessment.

Methods

We carried out a systematic review and meta-analysis of epidemiological studies featuring original peer-reviewed data on the association of total trihalomethane exposure and at least one outcome related to fetal growth.

Results

A comprehensive literature search yielded 37 studies for further consideration. Following the application of eligibility criteria based on study characteristics, we selected fifteen independent studies for the extraction of relative risks of several adverse birth outcomes. Sufficient data were available for meta-analyses to be carried out for four adverse birth outcomes: low birth weight (LBW), term low birth weight (TLBW), preterm delivery (PTD) and small for gestational age (SGA) (including intra uterine growth retardation (IUGR)). Small, positive statistically significant summary measures were found for SGA, but not for LBW, TLBW or PTD.

Conclusion

We found small, statistically significant, positive associations for SGA associated with TTHM exposure under various exposure timings. We investigated and discussed uncertainties relating particularly to exposure.