

THE RELATIONSHIP BETWEEN WATER DISINFECTION BY-PRODUCTS AND EARLY CHILDHOOD NEUROBEHAVIORAL DEVELOPMENT

Yen-Ju Lin, *Institute of Environmental Health, College of National Taiwan University, Taiwan*

Gen-Shuh Wang, *Institute of Environmental Health, College of National Taiwan University, Taiwan*

Pau-Chung Chen, *Institute of Occupational Medicine and Industrial Hygiene, College of National Taiwan University, Taiwan*

Background and Aims: Trihalomethane (THM), the most common DBPs were widely explored the relationship between by-products of disinfection of drinking water and congenital anomalies. However, the impact of THMs exposure on neurobehavioral development in children still remains unclear. The purpose of our study was to investigate the relationship between the TTHM and early childhood neurobehavioral development.

Methods: We conducted a cohort study of 400 mother-infant pairs in 2004-2007 using information from Taiwan birth cohort study (TBCS) and Waterworks Registry. All subjects finished questionnaires and the childhood neurobehavioral development scales when the children were at the ages of 6 months. The exposure periods was grouped into prenatal and postnatal period. We used the proportional hazard model to assess the relationship between different exposure levels and the milestone and controlled for potential confounders including infant sex, birth weight, parity, maternal age, maternal education, breast feeding duration, environmental tobacco smoking exposure, and care style.

Results: The prenatal exposure duration, in the proportional hazard model the hazard ratio of "Smile at the main caregiver spontaneously" (adjusted odds ratio: 0.59, 95% confidence interval: 0.42, 0.82), "Roll over" (0.68, 95% CI: 0.49, 0.95), "Transfer objects from one hand to the other" (0.58, 95% CI: 0.41, 0.82), and "Creep on belly" (0.39, 95% CI: 0.26, 0.63) were elevated in the high exposure compared to the reference category. And the risk of "Smile at the main caregiver spontaneously", "Transfer objects from one hand to the other", and "Creep on belly" showed an exposure-response pattern (test for trend: $p = 0.001$, 0.005 , and 0.0001).

Conclusions: The present study suggests that prenatal exposure to disinfection by-products increases the risk of delay motor at 6th months. Our findings indicated that prenatal exposure may influence the children developments significantly than the postnatal.