

TITLE: Prenatal Co-Exposure to Methylmercury and Inorganic Arsenic in Oregon

AUTHOR(S): Sarah Rothenberg

PRESENTER(S): Sarah Rothenberg

STUDENT SUBMISSION: No

TOPIC/TARGET AUDIENCE: Environmental Health

ABSTRACT: Background: Prenatal co-exposure to inorganic arsenic and methylmercury may adversely impact offspring development, and these impacts may be synergistic. Mercury may also impact the metabolism and excretion of arsenic. In the human body, arsenite is accumulated in cells through aquaporins, while mercury may act as an aquaporin inhibitor. In Oregon, there are statewide fish consumption advisories for methylmercury; groundwater arsenic levels are also elevated. Methods: We are currently enrolling pregnant mothers (<21 weeks gestation) at two hospitals in Oregon. Total mercury and/or methylmercury concentrations are analyzed in maternal hair, urine and blood, while arsenic species are analyzed in urine [inorganic arsenic, dimethylarsinic acid (DMA), and monomethylarsonic acid (MMA)]. Preliminary results: The sum of urine arsenic species (= inorganic As + DMA + MMA) averaged 2.8 ppm (median: 3.2 ppb, range: 0.31-4.4 ppb, n=13), which was comparable to other cohorts of pregnant mothers in the U.S. and Europe, where drinking water arsenic levels were low. Maternal hair total mercury averaged 0.27 ppm (median: 0.17 ppm, range: 0.02-1.0 ppm, n=27). Hair total mercury was not correlated with urine arsenic biomarkers (Spearman's rho range: -0.03, 0.19, p=0.54-0.92, n=13); however the number of paired samples was small. Enrollment and lab analyses are ongoing.

OBJECTIVE(S): Assess whether prenatal methylmercury and arsenic exposure levels are of concern among mothers enrolled in our pilot study. Evaluate the potential sources of arsenic, including tap water and diet. Assess whether mothers are aware of Oregon fish consumption advisories (based on where fish is purchased/caught).