S01-05 Methylmercury Exposure, Fish Consumption, and Cardiovascular Function in Faroese Whalingmen

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Methylmercury is a worldwide contaminant found in seafood and freshwater fish. It is a well-established neurotoxicant that can have serious adverse effects on the developing nervous system. Recent evidence has suggested that methylmercury may promote or predispose to the development of heart disease. However, certain essential nutrients in fish and seafood may provide beneficial effects on brain development, and may protect against the development of heart disease, thereby possibly counteracting the adverse effects of the toxicant. The impact on the same health outcomes by two exposures originating from the same food source provides a classic example of negative confounding. We examined 42 Faroese whalingmen (aged 30-70 years) to assess possible adverse effects within a wide range of methylmercury exposures from consumption of pilot whale meat. The number of fish dinners consumed per week in the last year was included as a covariate that was allowed to affect both mercury exposure and outcomes. Exposure levels were assessed from mercury analysis of toenails and whole blood obtained at the time of clinical examination, and of a hair sample collected seven years previously. Outcome measures include heart rate variability, blood pressure (BP), common carotid intima-media thickness (IMT), and brainstem auditory evoked potentials. Multiple regression and structural equation analyses were carried out to determine the confounder-adjusted effect of mercury exposure. Taking into account correlations among related measures, exposure and outcomes were categorized in groups to derive latent exposure and response variables in structural equation models. Multiple

regression analysis was used to compare the predictive validity of individual exposure biomarkers and the latent exposure variable on individual and latent outcomes. The toenail mercury concentrations varied widely and had a geometric mean of 2.0 μg/g; hair concentrations averaged about 3-fold higher. The strongest associations were seen with BP and IMT, with toenail mercury as the strongest predictor. Adjustment for the benefits from fish consumption resulted in strengthened associations between mercury exposure and increased BP and IMT. The results suggest that substantial underestimation of the effects of mercury toxicity and fish benefit occurs from the lack of mutual adjustment. Regulatory agencies s

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