

Gender-related metal exposure of the Austrian population

Claudia Gundacker¹ Gunter Komarnicki¹ Christian Forster¹ Ernst Schuster⁴ Karl Wittmann¹

¹ Medical University of Vienna, Center for Public Health, Dept. Ecotoxicology, Vienna, Austria

Gender-related differences in exposure to heavy metals and health effects remain highly neglected research areas. No data were available on the gender-related metal exposure of the Austrian population. Venous blood samples were provided by 159 volunteers (78 women, 81 men). Study participants filled in a questionnaire on medical history, lifestyle, nutrition, and smoking. Whole blood samples were wet-ashed with nitric acid. Mercury (Hg), lead (Pb), cadmium (Cd), and nickel (Ni) concentrations were analyzed employing Atomic Absorption Spectrophotometry (ET-AAS, GF-AAS, CV-AAS after hydrid formation and amalgamation). Males showed significantly higher blood Pb concentrations ($P=0.001$) probably caused by occupational exposure and avocational activities. However no significant difference was found for Hg, Cd, and Ni levels comparing females and males. The predictors for elevated metal levels showed no coherent picture. Age correlated to higher Pb and Cd contents in both genders, as well as smoking to higher Cd levels in both females and males. But in many cases, different variables determined metal levels of females and males. Basic education and tap water consumption (leaded water pipes) were significant predictors ($P<0.05$) of higher Pb levels only in males. Females however consumed more frequently fish and seafood in combination with wine (both fish and wine are well-known sources of Hg exposure), and Hg concentrations of females correlated more often and more significant with these variables. Hair dying led to significantly higher Ni levels only in females. Therefore, it can be concluded that gender influences metal levels due to gender-specific behaviour and life circumstances.