

Middle European data on mercury exposure: biomonitoring results of human and aquatic vertebrates' samples

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Introduction: Mercury is still regarded as a significant health hazard. In developed countries the main source of methyl-mercury intake is from consumption of fish.

Objective: To assess the level of exposure to mercury in children and to characterize the distribution of mercury in the environment by bioindicators (fish from different regions) in Austria.

Methods:

Within the project “**Air and Children**” (LuKi) evaluating indoor pollution in nine elementary schools in three regions of Austria also concentration of mercury in hair of school children was measured. In the **Austrian Human Biomonitoring Survey** (HBMOe) internal exposure of a small sentinel sample of the Austrian population to industrial chemicals (in blood and urine) and methyl-mercury (hair) was determined

In both studies a questionnaire was applied to identify exposure-related behaviour patterns and environmental conditions.

Results:

In the **Luki-study** mercury was detected in 409 out of 413 hair samples of children above LOD. The median concentration was 149 µg/kg. Mercury levels correlated with total fish consumption.

In the **HBMOe-study** distinctly lower concentrations were found in 50 mother-child pairs with mothers having significant higher levels (median: 64 µg/kg) as their children (median: 6 µg/kg). In mothers methyl-mercury levels correlated significantly with CNS-symptoms, fish consumption and number of amalgam fillings.

In the **QUESEFI-study** wild fish showed significantly higher mercury levels than cultured fish. Marine fish were most contaminated. Young trouts and in part also young carps displayed significantly higher mercury levels than older animals.

Conclusions:

The two cross-sectional studies indicate a strong variation of the level of exposure to mercury in the population. While within these studies about 40% of the variation in the concentration of mercury in hair could be related to differences in fish consumption, the large difference of 25-fold between the studies cannot be explained by fish consumption alone but could be due to seasonal and regional differences. Although levels of mercury found in hair were low, even at these low levels correlations with symptoms were demonstrated. In the regional aquatic environment we found evidence for mercury bioaccumulation along the food chain. At this stage it is reasonable to continue improving waste management and to give advice about fish

consumption (local fish, less consumption of predators etc.). This holds for Europe as well as for Africa.

Keywords: epidemiology, fish, biomonitoring, mercury

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