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Abstract Book

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NEUROTOXIC EFFECTS DUE TO LOW LEVELS OF MERCURY EXPOSURE

Roberto Lucchini[1], Donatella Camerino[2], Plinio Carta[3], Leonardo Soleo[4], Lorenzo Alessio[1]
(1). Institute of Occupational Health, University of Brescia, Italy
(2). Department of Occupational Health, University of Milan, Italy
(3). Department of Public Health – Section of Occupational Medicine, University of Cagliari, Italy
(4). Institute of Occupational Health, University of Bari, Italy

Objectives. To assess early effects on the Central Nervous System due to occupational exposure at low levels of inorganic mercury (Hg) a multicenter nation-wide cross-sectional study was performed, including workers from chloro-alkali plants, chemical industry, thermometer and fluorescent lamp manufacturing. The contribution of non-occupational exposure to inorganic Hg from dental amalgams and to organic Hg from fish consumption was also considered.

Methods. Neuropsychological and neuroendocrine functions were examined in a population of 122 workers occupationally exposed to inorganic Hg, and 218 control subjects, not occupationally exposed to Hg. Neuropsychological functions were assessed using neurobehavioral testing including vigilance, motor and cognitive function and tremor measurements. Neuropsychological symptoms and mood profile were also evaluated. Neuroendocrine functions were examined with the measurement of prolactin secretion. The target population was also characterized by the surface of dental amalgams and seafood consumption. The data were analyzed using ANOVA and Mixed Linear Models.

Results. In the exposed workers the mean urinary Hg (HgU) was 10.4±6.9 (median 8.3, range 0.2-35.2) μg/g creatinine, whereas in the control group the mean HgU was 2.4±3.3 (median 1.5, range 0.1-33.2) μg/g creatinine. The results indicated an homogeneous distribution of most neurobehavioral parameters among exposed and controls. On the contrary, finger tapping ($p<0.01$) and the BAMT (Branches Alternate Movement Task) coordination test ($p=0.05$) were associated with the occupational exposure, indicating an impairment in the exposed subjects. Prolactin levels resulted significantly decreased among the exposed workers, and inversely related to HgU. On the contrary, no effects were observed as a function of dental amalgams. Finally, an inverse association was observed between most neuropsychological symptoms and seafood consumption.

Conclusions. In conclusion, this study supports the finding of early alterations of motor function and neuroendocrine secretion at very low exposure levels of inorganic Hg, below the current ACGIH BEI and below the most recent exposure levels reported in the literature.

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