EFFECTS OF EXPERIMENTAL METHYLMERCURY INTOXICATION: QUANTIFYING THE APOPTOTIC PROCESS IN BRAIN

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Methyl mercury (MeHg) is a widespread environmental pollutant that is characterized as a substance with potent toxic effects on the central nervous system (CNS). We have previously shown that MeHg infusion for 90 min. induces an immediate and significant elevation of extracellular glutamate levels (Juárez et al. 2001). In addition, the same concentrations that induce an increase in extracellular glutamate levels induce cell death by apoptosis, involving the NMDA receptor (Juárez et al., 2005). The aim of this study was to determine if these concentrations induce neuronal death in brain by apoptosis. Fifteen female Wistar rats (n=5) were administered with MeHg at doses of 2, 4 and 6 mg/kg body weight by esophageal tube for three weeks, on a daily basis, control group only water was administered. Animals were weighed at the beginning and end of the experiment. At the end of exposure, animals were perfused via intracardiac saline and PBS buffer solution with 4% paraformaldehyde, the brain and cerebellum were placed in a fixative solution to preserve them until their inclusion in paraffin. Tissues were cut by 7 microns thick and apoptosis in them was determined in situ using TUNEL immunohistochemistry assay. Animals that were given the highest dose, showed of apoptotic cells in the frontal cortex and cerebellum, these animals showed a significant weight loss compared to animals that were given lower doses which showed no evidence of apoptosis, suggesting that in cases of exposure to low doses of MeHg that do not significantly alter the animal metabolism in which apoptosis does not occur.

[1] Juárez, B. I., M. L. Martínez, M. Montante, L. Dufour. E. García, and M. E. Jiménez-Capdeville . 2002. Methylmercury increase extracellular glutamate levels in frontal cortex of awake rats. Neurotoxicol Teratology 24(2002) 767-771 Bertha I. Juárez, Haydée Portillo-Salazar, Roberto González-Amaro, Peter B. Mandeville,

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