Altered Metabolism of Dopamine in the Midbrain of Mice Treated with Tributyltin Chloride via Subacute Oral Exposure

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Tributyltin (TBT) compounds have been detected in fish and shellfish. One of the targets of TBT compounds is the central nervous system. Alterations in the levels of neurotransmitters and their metabolites, and ratios of the levels of neurotransmitters to those of their metabolites have been used as indexes of neurotoxicity. We evaluated the neurotoxicity of TBT compounds in mice following subacute oral exposure by determining the levels of neurotransmitters and their metabolites in discrete brain regions. Male BALB/c mice were exposed to 0, 1, 5, 25, or 125 ppm TBT chloride in their feed for one month. Following the treatment period, their brains were removed and dissected into the cerebrum, cerebellum, medulla oblongata, midbrain, corpus striatum and hypothalamus. The levels of norepinephrine, dopamine (DA), dihydroxyphenylacetic acid, homovanillic acid (HVA), serotonin, and 5-hydroxyindolacetic acid were determined in different brain regions by high-performance liquid chromatography (HPLC). The mean body weight of mice treated with 125 ppm TBT was significantly lower than that of the control from day 5 to day 16 during the treatment period. The HVA/DA ratio in the midbrain of the 125 ppm-treated group was significantly higher than those of other treatment groups, and tended to be higher than that of the control. TBT may affect DA metabolism in the brain, especially in the midbrain.

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