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Permanent sexual and regional noradrenergic system impairment after prenatal and postnatal exposure to chlordimeform

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Formamidines pesticides have been described to induce permanent effects on the development of monoaminergic neurotransmitter systems. The mechanisms that induce these effects are not known but it has been suggested that these effects could be related to monoamine oxidase (MAO) inhibition. Chlordimeform is a formamidine pesticide, which is a very weak inhibitor of MAO although it has been described to induce permanent and sex dependent alterations of serotonergic system. In order to confirm that formamidines induce permanent alterations of monoaminergic neurotransmitter systems regardless of MAO inhibition, the effects of maternal exposure to chlordimeform (5 mg/kg bw, orally) on brain region dopamine and noradrenaline levels of male and female offspring rats at 60 days of age were evaluated. The results showed that chlordimeform induced a significant decrease of noradrenaline levels in the prefrontal cortex and striatum, showing an interaction by sex for these regions. Chlordimeform also caused a decrease of MHPG and HVA metabolites levels in the prefrontal cortex and striatum. Lastly, it decreased the turnover of NA in frontal cortex and striatum. The present findings indicate that maternal exposure to chlordimeform altered noradrenergic neurochemistry in their offspring in a region and sex dependent way, and those variations confirm that other mechanisms different from MAO inhibition are implicated.

Biography

Javier del Pino has received his PharmD degree at the University Complutense, University of Madrid in 2004. He has two Master degrees in Sciences in 2009 and 2010. He has specialized in neurotoxicology and neurodevelopmental toxicology and received his PhD in Toxicology in 2009. In 2010 he has worked in Institute of Health Carlos III in the National Center of Environmental Health. From 2010 to 2012 he was an Associate Researcher at University of Massachusetts (UMASS) working in Sandra Petersen's Lab in a National Institute of Health (NIH) project on developmental effects of TCDD endocrine disruptor on sexual differentiation. In 2012 he became an Assistant Professor of Toxicology at the Complutense University of Madrid.

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