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Sexual and regional permanent dopaminergic system impairment after prenatal and postnatal exposure to chlordimeform

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Formamidine pesticides induce permanent effects on development of monoaminergic neurotransmitter systems. In this regard, chlordimeform induces permanent sex-dependent alterations of serotonergic and noradrenergic systems, but there is no information on dopaminergic system. 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. In order to determine whether chlordimeform induces permanent alterations of dopaminergic system, the effects of maternal exposure to chlordimeform (5 mg/kg bw, orally on days 6–21 of pregnancy and 1–10 of lactation) on dopamine levels in different brain regions of male and female offspring rats at 60 days of age were evaluated by HPLC. Maternal and offspring body weight, physical and general activity developments were unaffected. Our results show that chlordimeform induced a significant decrease of dopamine levels in the prefrontal cortex, hippocampus and striatum, showing a gender interaction for these regions. Chlordimeform also caused a decrease of DOPAC levels in the striatum. Moreover, it induced an increase in the content of metabolites DOPAC and HVA in the hippocampus and an increase in the metabolite content of DOPAC in the striatum. Lastly, it increased the turnover of DA in the hippocampus and striatum and decreased the turnover of DA in frontal cortex. The present findings indicate that maternal exposure to chlordimeform altered dopaminergic neurochemistry in their offspring in a region and sex-dependent way.

Biography

Javier Del Pino received his PharmD degree from the University Complutense University of Madrid in 2004. He has two Master degrees. He specialized in Neurotoxicology and Neurodevelopmental Toxicology and received his PhD in Toxicology in the year 2009. In 2010, he worked at the Institute of Health Carlos III in the National Center of Environmental Health. From 2010 to 2012, he was an Associated Researcher at University of Massachusetts (UMASS) working in Sandra Petersen's Lab at a National Institute of Health (NIH) project on developmental effects of TCDD endocrine disruptor on sexual differentiation. In 2016, he became an Associated Professor of Toxicology at the Complutense University of Madrid.

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