

7th Euro-Global Summit on

Toxicology & Applied Pharmacology

October 24-26, 2016 Rome, Italy

Neonatal chlorpyrifos exposure induces loss of dopaminergic neurons in young adult rats

Lingling Zhao and Yuan-ying Deng

Third Xiangya Hospital of Central South University, P R China

Increasing epidemiological and toxicological evidence suggests that pesticides and exposures may be associated with the development of Parkinson's disease (PD). Chlorpyrifos (CPF) is a widely used organophosphorous pesticide with developmental neurotoxicity. Its neurotoxicity, notably on the monoamine system, suggests that exposure of CPF may induce dopaminergic neuronal injury. We investigated whether neonatal exposure to CPF contributes to initiation and progression of dopaminergic neurotoxicity and explored the possible underlying mechanisms. The newborn rats were administrated 5 mg/kg CPF subcutaneously from postnatal day (PND) 11 to PND 14 daily. The effect of CPF on dopaminergic neurons, microglia, astrocyte, nuclear factor- κ B (NF- κ B) p. 65 and p. 38 mitogen-activated protein kinase (MAPK) signaling pathways was analyzed in the substantia nigra of rats at 12 h, 24 h, 72 h, 16 d and 46 d after exposure. CPF-treated rats exhibited significant reduction of dopaminergic neurons at 16 d and 46 d after exposure, and a significant increase in the expression of microglia and astrocytes in the substantia nigra after CPF exposure. Intense activation of NF- κ B p. 65 and p. 38 MAPK inflammatory signaling pathways was observed. Our findings indicate that neonatal exposure to CPF may induce long term dopaminergic neuronal damage in the substantia nigra mediated by the activation of inflammatory response via NF- κ B p. 65 and p. 38 MAPK pathways in the nigrostriatal system.

Biography

Lingling Zhao has completed her PhD from Central South University. She is the Director of Pediatric of the Third Xiangya Hospital of Central South University. She has researched on the relation of environment and children's health for more than ten years.

Notes: