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Neurobehavioral and cognitive changes in mice offspring following prenatal exposure to paraquat

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Statement of the Problem: The herbicide paraquat is a wide used product. Its role in the pathogenesis of some brain disorders has become intensely debated and gained increasing interest in recent years. The aim of our study is to investigate the developmental and neurobehavioral effects of prenatal exposure to this product in mice.

Material & Methodology: In the present work, we investigated the acute and developmental toxicity of PQ, from the 1st or 6th day of mating and throughout the gestation period. We have examined several parameters, including toxicity indices, reproductive performance and sensorimotor development, as well as anxiety and cognitive performance of the offspring.

Findings: Our results showed that exposure to 20 mg/kg of Paraquat during the first days of pregnancy completely prevent pregnancy in treated mice. Ingestion of a tolerable dose from the 6th day of pregnancy caused an alteration in fertility and reproductive parameters and a decrease in litter size. In offspring, paraquat is responsible for a variety of behavioral disorders, manifested as an overall delay of innate reflexes and a deficit in motor development. All exposed animals showed a decrease in the level of locomotor activity, increased levels of anxiety and pronounced cognitive impairment in adulthood. Immunohistochemical studies have shown a decrease in the number of TH-immunoreactive neurons in the substantia nigra and intense glial proliferation in the hippocampus (using GFAP) in treated animals.

Conclusion & Significance: These results demonstrated that paraquat led to the onset of many behavioral changes that stem from the impairment of neuronal developmental processes in prenatally exposed mice.

Biography

Yassine Ait Bali is a Research Neurocientist at the Pharmacology, Neurobiology and Behavior Laboratory. His research interests have focused on the Neurotoxicology field. He is concentrating mainly on the relationship between pesticides side effects and the onset of brain diseases especially following developmental exposures covering all the aspects of neurological disease at different levels: Behavioral, morphological, physiological and molecular.

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