

POTENTIAL ROLE OF ORGANOPHOSPHATE INSECTICIDE CHLORPYRIFOS IN AUTISM SPECTRUM DISORDER (ASD)

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Autism spectrum disorder (ASD) is a neurological and developmental disorder that begins early in childhood and lasts throughout a person's life. ASD is characterized by impairment in interaction and social communication, in addition to pro-inflammatory cytokine imbalances with chronic neuroinflammation. Environmental exposures may increase the risk of ASD. There are evidences that as the residue crosses the blood-brain barrier and placenta the fetuses can be exposed to pesticides. The purpose of this study is to summarize and discuss the relationship between autism spectrum disorder and chlorpyrifos, an organophosphate insecticide. The narrative review was performed using MEDLINE, LILACS, Web of Science, Scopus and Science Direct as databases and pesticides, agrochemicals, insecticides, herbicides, Autism disorder as descriptors. Gestational contact with chlorpyrifos interferes early neuromotor development and causes deficits in social behaviour that can lead to long-term deficits in behaviour and repetitive behaviour, as a routine preference. Studies have shown that the contact of chlorpyrifos with already autistic rats increased the characteristics of this disorder in the animals. In addition, contact with chlorpyrifos causes redox imbalance, oxidative stress, mitochondrial dysfunction associated with glutathione deficiency. Studies have also shown that there is a high probability of developing imbalances in the intestinal flora. Autistic individuals may as well exhibit proinflammatory cytokine imbalances and may suffer from hyperactive or dysfunctional immune systems, with chronic neuroinflammation, including neuroglial activation in the brain, and the presence of autoantibodies to brain proteins. Thus, we can conclude that exposures to agricultural pesticides such as chlorpyrifos, through the uterine pathway are related to autism and that there is strong evidence that contact with pesticides may influence the development of autism spectrum disorder.

Biography

Gislei Frota Aragão is graduated in Pharmacy, with Masters and PhD in Pharmacology with a focus on neuropharmacology. Professor of Medical Course at the State University of Ceará (UECE/Brazil) and He is coordinator of the Group of Studies in Neuroinflammation and Neurotoxicology (GENIT). Pharmacist of the Federal University of Ceará (UFC) acting in the Clinical Pharmacology Unit and as a researcher in the laboratory of toxicology and clinical exams in the Drug Research and Development Center (NPDM) with collaborations in the professional Master of Clinical Pharmacology/UFC, Master of Transplantation/UECE and Specialization in Collective Health/UECE, developing projects in the area of neuropharmacology, neurotoxicology, neuroinflammation and pharmacovigilance.

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