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Environmental contamination as a source of multi-toxics via maternal exposure and connection with childhood diseases like autism spectrum disorders – *One Health* perspective

João Soares Carrola [1,2], Carla Gonçalves [1,2,3], Alexandra Bento [2,3], Ricardo Jorge Dinis-Oliveira [4,5,6] and Sandra Leal [4,5,*]

[1] University of Trás-os-Montes and Alto Douro (UTAD), Vila Real, Portugal
[2] Centre for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB), Institute for Innovation, Capacity Building and Sustainability of Agri-food Production (Inov4Agro), Vila Real, Portugal
[3] INSA- Instituto Nacional de Saúde Doutor Ricardo Jorge, Portugal
[4] UCIBIO – Applied Molecular Biosciences Unit, Translational Toxicology Research Laboratory, University Institute of Health Sciences (1H-TOXRUN, IUCS-CESPU), 4585-116 Gandra, Portugal
[5] Associate Laboratory i4HB - Institute for Health and Bioeconomy, University Institute of Health Sciences - CESPU, 4585-116 Gandra, Portugal.
[6] Department of Public Health and Forensic Sciences and Medical Education, Faculty of Medicine, University of Porto, 4200-319 Porto, Portugal

* Correspondence: sandra.leal@iucs.cespu.pt

Abstract

Background: Environmental pollution exposes human to various toxics. Food is one main route of toxic exposure, encompass pesticides, per- and polyfluoroalkyl substances (PFAS), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals and nanoplastics [1]. Maternal exposure is a concern due to rising childhood neurodevelopmental disorders like autism spectrum disorders (ASD) [1,2] and environmental contaminants are suspected to be a main potential cause of these disorders, with significant socioeconomic costs [2,3]. **Objective:** Verify the association between maternal exposure to toxics and the increase in the prevalence of ASD at pediatric ages. **Methods:** This mini-review was based on the search of review papers using the *PubMed* database and after that, a second selection was done using the title and abstract analysis to select the most relevant publications. **Results:** Women of childbearing age are exposed to complex mixtures of environmental toxicants, leading to potential maternal transfer to the fetus. Even at low-dose, pregnant women exposed to toxics through food, air, or skin pose a risk to developing fetus (4-18 weeks) [4], potentially impairing brain growth and function. Some studies indicate that pesticides, phthalates, cosmetics (e.g. fragrances, face makeups) detergents, and food flavors, pesticides, lead, methyl-mercury, aluminum, PCBs, PAHs, PBDEs, and perfluorinated compounds may have an impact on ASD emergence. Others focused on biomarkers in autistic individuals [5], namely prenatal methylmercury exposure in mother-child pairs from a population with high fish consumption. There is also evidence that advanced parental ages, genetic predisposition, drugs and pharmaceutical use during pregnancy, stressful life events, or environmental hardship can also contribute to ASD. **Conclusions:** Human exposure to multiple toxicants is nearly unavoidable, contributing to neurotoxic effects linked to brain disorders. Early-life exposures to toxicants can impair brain development and may contribute to an increase in ASD prevalence. It is important to enhance awareness among women to avoid some toxicants, particularly during pregnancy, to minimize the risk of neurodevelopmental disorders.

Keywords: environmental pollution; food toxicants; early-life exposure; cognitive diseases; autism spectrum

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