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Human developmental toxicity of mixture chemical exposure from e-waste recycling

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Electronic waste (e-waste) is an emerging environmental health issue because of its fast accumulation as well as inadequate development in recycling technology. Guiyu, a town in south China, is one of the biggest e-waste recycling centers of the world. E-waste is disassembled and recycled by locals with crude and uncontrolled methods that produce extensive environmental pollutants. Our research focuses on developmental toxicity of prenatal and early postnatal exposure to heavy metals and persistent organic pollutants from e-waste recycling.

Our result showed that Guiyu children and/or neonates had significantly elevated blood lead (Pb), cadmium (Cd), chromium (Cr), manganese (Mn), nickel (Ni), PBDEs, PAHs, PCB and PFOA, and with impairment of neuro-behavioral development, temperament alterations, lower forced volume vital capacity (FVC), lower HBsAb concentrations and percentage and counts of NK cells, damage of lymphocyte DNA and changes of antioxidant enzymes activities. Guiyu neonates showed much higher rates of adverse birth outcomes such as stillbirth, low birth weight, term low birth weight, mean birth weight, intrauterine growth retardation and lower Apgar scores. Boys are with shorter anogenital distance.

Our studies suggest that environmental pollution by improper e-waste process has adversely affect child and infant health and development. This kind of exposure to e-waste chemicals may cause long-term adverse outcomes for health.

Our studies suggest that exposure to improper e-waste recycling in Guiyu has adversely affect child and infant health and development. This kind of exposure may cause long-term adverse outcomes for health.

Biography

Xia Huo has completed her Ph.D. from the First Military Medical University of China and postdoctoral training from The University of Texas Medical Branch. Currently, she is the director and professor of Analytical Cytology Lab, Shantou University Medical College. Her research interests focus on environmental health impacts of e-waste, environmental toxicology and developmental toxicology. She has published more than 35 papers in reputed journals including Environmental Health Perspectives, Environment International, Environmental Science & Technology, Environment Research, Science of Total Environment, Reproductive Toxicology, Neurotoxicology. She is serving as an editorial member of several reputed journals.

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