

Pesticide Residues and Lead: Neurotoxins in The Home Environment

Short communication

Volume 4 Issue 3- 2023

Author Details

Joseph Laquatra PhD*

Cornell University, USA

*Corresponding author

Joseph Laquatra PhD, Cornell University, USA

Article History

Received: November 10, 2023 Accepted: November 13, 2023 Published: November 13, 2023

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Despite the existence of chemical-free methods to eradicate pests, Americans use over one billion pounds of pesticides per year. Residues of these pesticides enter homes through tracking with shoes, bare feet, clothing, or animal fur; airborne entry; and soil gas entry. Because of spray drift and volatility, adjacency and proximity to agricultural operations can be responsible for residential pesticide residues. Pesticide use in and around homes is another factor responsible for these residues. Numerous health problems occur from exposure to pesticides, such as cancer, birth defects, leukemia, and ocular toxicity. Because of crawling and hand-to-mouth behaviors, children are more vulnerable than adults to adverse health effects from pesticide exposure.

Human beings have used lead for various purposes for at least 7,000 years (Cochran 2006). The Ancient Egyptians, Chinese, Romans, and others used lead for medicinal and cosmetic purposes, roofing, plumbing pipes, goblets, vases, pots, coins, stationery and pottery glazing, among other uses. Although awareness of lead poisoning has existed for over 2,000 years [1], lead is still present in our environment.

Lead exposure occurs through ingestion, inhalation, and dermatological contact, and lead poisoning can affect nearly every organ in the body [2]. According to the World Health Organization [3], lead's adverse health effects include cognitive deficits, attention deficit disorder, behavior problems, dyslexia, hypertension, immunotoxicity, reproductive system damage, convulsions, coma, and death. While children are at higher risk of problems associated with lead poisoning, adults are affected as well. Although the United States (U.S.) Centers for Disease Control and Prevention (CDC) has set 5 micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dl}$) as a reference level for public health actions, research has demonstrated that there is no threshold for health problems associated with lead exposure [4]. In other words, there is no safe level of contact with lead.

In 1909 France, Belgium, and Austria banned the use of white-lead

paint [2]. Lead was banned in the U.S. as an ingredient in residential paint in 1978, and from gasoline in 1986, but there are an estimated 50 million homes and apartments in the U.S. with lead-based paint [4], and soil throughout the country is contaminated with lead from car exhaust emissions that occurred before the leaded gasoline ban. Beyond these issues, lead continues to be used in products that are used and consumed on a daily basis around the world. Lead exposure also occurs when processing discarded consumer goods. This includes an emerging risk of extensive lead poisoning in China, where crude methods are used to harvest metals from recycled electronic waste (e-waste), resulting in extensive soil and water contamination and elevated blood lead levels in children [5].

Despite awareness of the dangers of lead exposure [6], lead in consumer products continues to be the reason for recalls [7], and the majority of those recalled products originate in China. Consumer education on this topic is ongoing, but should be expanded.

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