



School Pesticide Monitor

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Childhood Exposure to Insecticides Associated with Brain Tumors

A new study concludes that exposures during pregnancy and childhood to insecticides that target the nervous system, such as organophosphates (OPs) and carbamates, are associated with childhood brain tumors (CBT). The researchers hypothesize that this susceptibility might be increased in children with genetic variations that affect the metabolism of these chemicals.

The study, "Childhood Brain Tumors, Residential Insecticide Exposure, and Pesticide Metabolism Genes," published in the journal *Environmental Health Perspectives*, examines whether childhood brain tumors provides evidence that exposure to insecticides, paired with specific metabolism gene variants, may increase the risk of CBT.

DNA was extracted from archival screening samples for 201 cases ≤ 10 years of age

and born in California or Washington State between 1978 and 1990. Insecticide exposures during pregnancy and childhood were classified based on interviews with participants' mothers. The children's mothers reported whether they or anyone else had chemically treated the child's home for insects including termites, fleas, ants, cockroaches, silverfish, or "other" pests.

The results are consistent with the possibility that children with a reduced ability to metabolize OP and carbamate insecticides might be at increased risk of CBT when sufficiently exposed. Among exposed children, CBT risk increased with PON1-108T allele - a gene which reduces the activity of paraoxonase (PON1), a key enzyme in the metabolism and neutralization of acetylcholinesterase (AChE) inhibitors: notably OPs. In other words, children with brain tumors were more

likely to carry the enzyme-inhibiting gene variant PON1-108T than other children.

The authors state that even though certain OPs have been phased out of residential use in the U.S., children remain exposed to these and other AChE inhibitors not only via the diet but also potentially via drift from use in agricultural areas, on golf courses, and for mosquito control. In the home, OP and carbamate insecticides remain in topical treatments for lice (malathion) and flea collars (tetrachlorvinphos, carbaryl, propoxur).

Even though previous studies have also shown that farmworkers and persons exposed to high levels of pesticides have an increased risk of developing brain tumors, this study's result most strongly indicate the importance of exposures during early childhood and interaction with genotypes and enzyme levels.

Children Still Exposed to Toxic Arsenic in Playground Equipment

Although no longer allowed to be manufactured for new playground, deck and landscaping timbers, chromated-copper-arsenic (CCA), a hazardous wood preservative still allowed for use on utility poles, continues to be found on children's playgrounds. For decades, CCA-treated lumber was the wood of choice nationally for play structures, picnic tables, decks and fencing.

Researchers at Tulane University sampled playgrounds from the City of New Orleans metropolitan area and found that 56.8% of wood sampled are treated with CCA and 78% of soils sampled from playgrounds contain levels of arsenic greater than the state "acceptable" level. One playground in particular contained

CCA-treated wood that had been chipped and used as a cushioning ground surface around slides, swings and other equipment from which a child might fall. These chips contain high concentrations, 813 to 1,654 ppm, of leachable arsenic.

The researchers also examined the effect of a child's ingestion of contaminated soil. Soil samples were digested in one-molar nitric acid, a solution meant to mimic the pH of a child's stomach, and found that the median arsenic concentration that resulted was on the order of 57 ppm - a concentration much higher than the median of 1.5 ppm in soils generally found throughout the city of New Orleans.

Tulane University's Center for Bioen-

vironmental Research Howard Mielke, PhD, and his colleagues, concerned about risks to children posed by treated wood, presented their results, "Soil arsenic surveys of New Orleans: Localized hazards in children's play areas," at the 30th Annual North American Meeting of the Society of Environmental Toxicology and Chemistry.

"The irony," Dr. Mielke contends, "is that if you want to find arsenic in soil, go to a child's play area with wood structures. They will likely be pressure treated with the CCA combo and leach substantial quantities of this carcinogen and neurotoxic agent into soil." He predicts New Orleans' arsenic hazard will not prove

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Biomonitoring Links Brain Effects to Neurotoxic Chemical Exposure

The national Learning and Developmental Disabilities Initiative (LDDI) released the first-ever biomonitoring report identifying toxic chemical pollution in people from the learning and developmental disability community. *Mind, Disrupted: How Toxic Chemicals May Affect How We Think and Who We Are* examines 61 toxic chemicals present in project participants in the context of rising rates of autism, attention-deficit hyperactivity disorder, and other learning and developmental disabilities.

In the U. S., 5-15% of children under age 18 are affected by learning and developmental disabilities. Reported cases of autism spectrum disorders have increased tenfold since the early 1990s. Based on current research, the Centers for Disease Control and Prevention (CDC) states that one in 110 eight-year-old children have autism in the United States.

Mind, Disrupted measures levels of a set of neurotoxic and endocrine-disrupting chemicals in the participants' bodies. A growing body of peer-reviewed scientific research, including animal and human studies, shows that these chemicals can disrupt the development and functioning of the brain and nervous system.

Eleven of the twelve study participants have detectable levels of triclosan in their bodies and all twelve participants have detectable levels of organochlorine pesticides in their bodies.

"Children are uniquely vulnerable to environmental exposures because their biological systems are still developing. During fetal development, exposures to even minuscule amounts of toxins at certain developmental windows can have

lifelong health impacts," acknowledged Larry Silver, M.D., author and a Clinical Professor of Psychiatry at Georgetown Medical Center and author of groundbreaking learning disabilities research. "By protecting children from toxic exposures, we can protect everyone. We need to create healthy environments to ensure all children can reach their full potential and contribute to society."

"Biomonitoring surveys conducted by the CDC indicate that most Americans carry in their bodies measurable levels of environmental chemicals that have been linked to neurological harm in laboratory and human studies," said Sharyle Patton, Director of the Commonwealth Biomonitoring Resource Center. "Precaution would suggest that we limit exposures to these chemicals, starting immediately."

Research indicates that widespread use of triclosan causes a number of serious health and environmental problems. Chief among these issues is resistance to antibiotic medications and bacterial cleansers, a problem for all people, but especially vulnerable populations such as infants and the elderly. Triclosan is also a known endocrine disruptor and has been shown to affect male and female reproductive hormones, which could potentially increase the risk for cancer. Further, the pesticide can interact with other chemicals to form chloroform and break down to dioxin, thereby exposing consumers to even more dangerous chemicals.

Exposure to triclosan is widespread and now found in the urine of 75% of the U.S. population, according to the *Fourth National Report on Human Exposure to Environmental Chemicals*, published by the

CDC. Due to the fact that many products containing triclosan are washed down the drain, triclosan shows up in water systems and sewage sludge. Accumulation of the pesticide in waterways and soil has been shown to threaten ecosystems and produce hazardous residues in fish.

Last month, environmental and health groups petitioned the Environmental Protection Agency (EPA) to ban all non-medical use of the antimicrobial pesticide triclosan. Over 80 groups, lead by Beyond Pesticides and Food and Water Watch, say EPA must act to stop the use of a chemical now commonly found in soaps, toothpaste, deodorants, cosmetics, clothing, and plastic.

Organochlorine pesticides, whether the banned yet ubiquitous DDT or the still used insecticides dicofol, endosulfan and lindane, continue to cause long-term and destructive effects on human health and the environment.

For example, lindane, commonly used in head lice treatments in the U.S., has been linked to seizures, developmental disabilities and hormone disruption. It is known to be particularly hazardous to children. Lindane and associated isomers are among the most ubiquitous chemicals in the Arctic environment, contaminating traditional foods of Indigenous communities in the region. Lindane is banned in the state of California and has also been restricted in Michigan for use on head lice and scabies.

Get your school, municipality, or institution to adopt toxic pesticide-free practices and implement safer pest management strategies. Contact Beyond Pesticides for more information.

Children Still Exposed to Toxic Arsenic in Playground Equipment

continued from page one

unique: "I would expect to see it all over the country."

Beyond Pesticides has called for the banning of heavy duty wood preservatives and maintains that the slow phase-out of residential uses of these chemicals does not adequately protect public health or the environment. Wood preservatives are

known to leach from previously treated wood, and children, as demonstrated in this study, are at risk when they put their unwashed hands in their mouths after touching soil or wood that is contaminated with preservatives.

Although, as of January 2004, most residential uses of CCA can no longer be manufactured for decks and patios, picnic tables, playground equipment, walk-

ways/boardwalks, landscaping timbers, or fencing, already existing residential CCA-treated wood and structures may continue to be sold and used. Continuing uses, such as utility poles, continue to be manufactured and put workers and the public at risk.

For Beyond Pesticides' Resource Kit to take action in your community and state, go to www.beyondpesticides.org/wood.