CHE Collaborative for Health & Environment

Webinar Highlights

Long-term Health Effects of Childhood Glyphosate Exposure

Rates of youth liver disease and metabolic disorders have increased dramatically in recent decades. In this webinar, **Dr. Brenda Eskenazi** presented the results of a long-term study examining possible links between glyphosate exposure and liver disease and metabolic disorders.

Featured Speaker: Brenda Eskenazi, PhD director of the Center for Environmental Research and Community Health (CERCH, cerch.berkeley.edu) at the School of Public Health, University of California at Berkeley, speaking April 13, 2023.

This fact sheet has been created by CHE based on information presented in an EDC Strategies Partnership webinar. Selected quotes in bold are from the webinar speaker(s). For the full set of resources provided by the webinar presenters, see the webinar page, where you'll also find associated Slides & Resources.

The Problem

A Salinas Valley Family practitioner, Dr. Charles Limbach, noticed that he was seeing more and more liver disease and metabolic disease in the children living in the Salinas Valley. A previous study had found an association between non-alcohol steatohepatitis (a type of liver disease) and glyphosate excretion. This led Dr. Limbach and other researchers, including Dr. Eskenazi, to investigate the health effects of childhood glyphosate exposure. Dr. Eskenazi stressed that we are currently seeing a drastic increase in liver disease and metabolic disease in children throughout the United States.

The researchers followed 480 mother-child pairs from pregnancy until the child turned 18. They also gathered additional data through a nested case-control study, in which they examined 60 young adults with elevated levels of certain liver enzymes and compared them with 91 young adults with normal levels of those enzymes. Elevated liver enzymes often indicate inflammation or damage to the liver.

The mother-child pairs were enrolled and studied through the **Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS)**. This is a long-running, longitudinal birth cohort study of pesticide and other chemical exposures. This study focused on primarily farmworker families in the Salinas Valley, California, and children born between 2000 and 2002.

The researchers measured urinary levels of glyphosate and a breakdown product of glyphosate, AMPA. Urine samples were collected during pregnancy and when the children reached the ages of 5, 14, and 18. The researchers also estimated the amount of glyphosate applied within a one-kilometer radius around each home from pregnancy through age 5, using pesticide application data reported to the state of California. When the children reached the age of 18, the researchers measured liver enzyme levels and markers of metabolic syndrome.

Key findings:

- Urinary markers of glyphosate and AMPA exposure in childhood were associated with elevated liver enzymes and elevated risk of metabolic syndrome.
- Living near agricultural glyphosate applications between birth and age 5 was also associated with metabolic syndrome at age 18.
- Glyphosate exposure in early childhood may increase risk of liver and metabolic disorders in young adults.

The mechanisms behind these health effects are not well understood. The following are some of the potential mechanisms:

- Via oxidative stress
- Via alteration gut microbiota
- Via endocrine disruption.

Dr. Eskenazi noted that children with liver disease and metabolic disorder are at greater risk for other health complications.

“Liver inflammation, cardiometabolic disease in our children is also going to increase their risk for liver cancer and diabetes and other metabolic diseases, cardiovascular diseases in adulthood.”

Recommendations

Dr. Eskenazi stressed the need for additional research, including studies with more frequent measures of exposure and studies that are collecting data during pregnancy.

"Exposures are higher now than they were in 2000 and we need to look at what in utero exposures are doing to the health of children."

Glyphosate is the most widely-used broad-spectrum herbicide in the world. In the last two decades, its use has increased dramatically. We need to get a clear understanding of additional health risks from glyphosate exposure. Since 2015, the International Agency for Research on Cancer (IARC) has classified glyphosate as a probable carcinogen. Other studies are also looking into possible associations between glyphosate exposure and endocrine disruption and adverse effects on reproductive health.

To Find Out More

- Watch the April 13, 2023 webinar: Long-term Health Effects of Childhood Glyphosate Exposure
- Read the study: Long-term Health Associations of Childhood Glyphosate Exposure: The CHAMACOS Study
- Read an article about the study: Kids' glyphosate exposure linked to liver disease and metabolic syndrome

About the Speaker

Brenda Eskenazi, PhD directs the Center for Environmental Research and Community Health (CERCH, cerch.berkeley.edu) at the School of Public Health, University of California at Berkeley. She is the Distinguished Jennifer and Brian Maxwell Professor Emeritus of Maternal and Child Health and Epidemiology. She is a neuropsychologist and epidemiologist whose long-standing research interest has been the effects of the environmental factors on human reproduction (both male and female) and child development. Her work has included the potential health effects of numerous toxicants on a wide spectrum of child health outcomes. Her work has a community-based participatory research focus, and she has been instrumental in illustrating the health conditions of farmworker families through the long-standing CHAMACOS project. Professor Eskenazi was awarded the prestigious John R. Goldsmith

award from the International Society of Environmental Epidemiology for lifetime achievement in environmental epidemiology.