Hereditary Toxins Spur Scientific Concerns

By Molly M. Ginty
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Synthetic chemicals that pervade the environment and the bodies of mothers and their children are attracting scientific inquiry. Next year, two major studies may help peg how exposure to these pollutants is related to disease. Second of two parts.

(WOMENSENEWS)--It starts in the first weeks of life.

Environmental pollutants are passing from mother to child

Credit: Ake Ericson / WPN.

As the umbilical cord sends nutrients to the fetus, pumping 300 quarts of blood per day, it also delivers what nature never intended: synthetic chemicals that may wreak havoc with development and cause health problems later in life.

The Atlanta-based Centers for Disease Control and Prevention, which tests the "body burden" of chemicals every two years, finds the average American now has 116 synthetic compounds in her body, including dioxin (produced by burning plastic), polycyclic aromatic hydrocarbons (found in auto exhaust) and organochlorine pesticides (found in farming areas).

Recent studies have detected these pesticides, plastics and polymers not only in umbilical cord blood, but in the placenta, in human milk and in the bloodstreams and body fat of infants.

Though some of these chemicals pass through body systems in a matter of days, they maintain a long-term presence because exposure is constant.

Scientists say women are especially sensitive to synthetic chemicals because these substances can interfere with female hormone cycles and because they adhere to body fat that is more prevalent in women than in men.

In 2007, California will launch the nation's first statewide, voluntary biomonitoring program to measure chemical contaminants in people and find out which pollutants are most common in the state's residents.

The National Institute of Child Health and Human Development next year will also begin a $2.5 billion

study to track children's exposures from birth to age 21, examining which chemicals are building up in the bodies of U.S. children and how they relate to individuals' susceptibility to different diseases.

Precautions Recommended

While waiting for the results of these and other studies, health advocates are encouraging consumers to shun pesticides, remove outdoor shoes in the house, choose fragrance- and toxin-free products, use baby bottles that are free of a carcinogenic chemical called bisphenol-A and press authorities for stricter laws and more studies.

"Manufacturers are producing new chemicals all the time with little government oversight," says Julia Brody, director of the Silent Spring Institute, based in Newton, Mass. "We need tighter restrictions, like those in Europe, if we hope to protect the next generation."

One toxin threatening mothers and children is mercury, which can spur breast cancer, autism and attention deficit disorder. In 2002, a study found that 1 in 6 U.S. women of reproductive age has enough of this contaminant in her blood to endanger a developing fetus.

Researchers say infants and children are also at high risk, because at the time of early and rapid growth, susceptibility to pollutants can be greatest.

How these pollutants wound up in babies' bodies--and what impact they may have on the next generation--are the subjects of inquiry by a growing number of concerned scientists.

According to federal records, U.S. companies produce an estimated 75,000 chemicals; of those, 3,000 are produced in amounts of more than a million pounds per year.

All told, more than 100,000 chemicals--some of them toxins that were banned decades ago--persist in the soil, air and water. Whenever people come into contact with these substances, they can pass through the skin, nostrils or mucus membranes and into bloodstreams and body fat.

Some compounds can linger for decades after a single exposure. Take DDT, a pesticide that can damage the nervous system. In May 2006, the Seattle-based Toxic-Free Legacy Coalition tested Washington residents and found 80 percent had detectible levels of the chemical in their bloodstreams 34 years after it was banned in the United States.

An Ohio power plant spews smoke into the air.

Credit: Michael Rubenstein / WPN.

'Increased Susceptibility' to Illness

"Our increased susceptibility to a variety of illnesses may be related not just to our exposure to these chemicals, but to exposures our mothers and grandmothers experienced during pregnancy," says Theo Colborn, president of the Endocrine Disruption Exchange, an environmental advocacy group based in Paonia, Colo.

The Washington-based Environmental Working Group in May tested mother-and-daughter pairs and found that each daughter had more chemicals in common with her mother than with other women. Because the mothers had decades more exposure, they had levels of lead, mercury and flame retardants in their bodies up to 5.2 times higher than their daughters.

To date, most studies on mother-to-child transmission--and on these chemicals' long-term effects--have been done on laboratory animals.

"It's unethical to experiment with these chemicals on people," says Shanna Swan, director of the Center for Reproductive Epidemiology at New York's University of Rochester. "And that's just one reason we

don't have clear answers. There are hundreds of chemicals involved here, and studying just one of them costs upwards of $1 million."

Representatives of the petro-chemical industry say that until studies prove otherwise, there is little reason to worry about these compounds' negative effects.

"Finding a chemical in the body doesn't tell you anything about the source of the exposure, what caused the exposure or what risk it might pose at that level," says Sarah Brozena, a senior director at the American Chemistry Council, an industry trade association in Arlington, Va.

Some scientists are more cautious.

"There is extensive evidence of harm in animals and growing evidence of harm in humans," says Frederick vom Saal, a professor of biology at the University of Missouri-Columbia.

Four-Generation Legacy

He points to an October 2006 study from Washington State University that showed damage caused by some pollutants could last for four generations.

Though scattered, studies on humans who were accidentally exposed to high levels of synthetic chemicals give a glimpse of their possible effects.

In 2000, a University of Michigan study found breast-fed girls exposed in utero to polybrominated biphenyls (PBBs, a type of flame retardant) started menstruating at an earlier-than-average age.

In 2002, a Taiwanese study examined men born to mothers who were exposed to polychlorinated biphenyls (PCBs, coolants banned in the U.S. in 1979). Researchers discovered the men's sperm were misshapen and could not swim as quickly or strongly as those of other men.

In 2005, Swan lead a University of Rochester study that examined phthalates, chemicals that soften plastic and help cosmetics adhere without smudging. She discovered that exposure to these compounds in utero resulted in the "feminization" of baby boys, who had smaller penises, shorter distances between the anus and genitals, and a higher risk for undescended testicles.

Health advocates suspect synthetic chemicals such as these may be linked to a whole flurry of health problems that have grown more common since industrialization surged in the past century.

They say pollutants may be partly responsible for the rising incidence of breast cancer, up 90 percent in 50 years and triggered in lab studies by organochlorine pesticides, mercury, PAH (found in auto emissions) and polyvinyl chloride (PVC, found in plastics).

Other health problems that researchers say may be linked to environmental toxins include male infertility, which has increased twelvefold in the past 80 years; prostate cancer, up 75 percent in 30 years; diabetes, which has doubled in the past 25 years; and obesity, which has doubled in the past 15 years.

This is the second of two parts looking at the impact of environmental pollutants on females.

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