Household chemicals may impair thyroid in young girls

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Early childhood exposures to specific phthalates were associated with depressed thyroid function in girls at age 3, according to scientists at Columbia University's Mailman School of Public Health. Phthalates, a

class of chemicals thought to disrupt the endocrine system, are widely used in consumer products from plastic toys to household building materials to shampoos.

The study is the first to assess the link between phthalate exposure and thyroid function in children over time. Results appear the journal *Environment International*.

Measures of five phthalates and two thyroid hormones were collected from 229 women during pregnancy and 229 children at age 3 enrolled in the Mothers and Newborns Study at the Columbia Center for Children's Environmental Health. In girls, lower levels of the active thyroid hormone free thyroxin (FT4) were associated with metabolites of mono-n-butyl phthalate (MnBP), mono isobutyl phthalate (MiBP), monobenzyl phthalate (MBzP), and monoethyl phthalate (MEP).

"The thyroid acts as the master controller of brain development," says senior author Pam Factor-Litvak, professor of Epidemiology at the Mailman School. "Thyroid hormones set the schedule, and if the timing is out of synch, there may be later consequences in the brain. The thyroid disruptions we see in this study, although they fall within the normal range, could explain some of the cognitive problems we see in children exposed to phthalates and we are currently investigating that. As we know from lead, even small exposures can make a big difference."

Previous Mailman School studies have found links between prenatal exposure to phthalates and risk for lower IQ at age 7, childhood asthma, and mental and motor development problems in preschool children.

"Parents with young children should avoid using products containing phthalates such as shampoos, nail polish, and vinyl flooring," says Factor-Litvak.

Girls, Not Boys

The researchers note that thyroid disturbances are more prevalent in women than men, potentially making them more vulnerable to thyroid-disrupting chemicals, even in early childhood. This may explain why they found a link between phthalate exposure and depressed thyroid in girls.

Prenatal Exposures

The researchers found little evidence that prenatal exposure to phthalates affected thyroid function at age 3, although they say maternal thyroid function, which was not measured, could potentially have been affected (during pregnancy, the fetus gets thyroid hormones through the mother). Surprisingly, they found prenatal exposure to a metabolite of Di (2-ethylhexyl) phthalate (DEHP) was associated with elevated levels of FT4, a finding they say suggests phthalates affect thyroid function differently depending on age of exposure.

Difficult Thyroid Measure

No association was seen between exposure to phthalates and levels of thyroid stimulating hormone at age 3, although previous research has shown TSH to be difficult to measure.

"Going forward, it's important to learn what phthalates do to harm children, as well as the route by which this harm is inflicted," says Factor-Litvak. "Our overarching goal is to protect the health of future generations."

Provided by Columbia University's Mailman School of Public Health