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Hypothyroidism Linked to Flame Retardants

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With commentary by lead study author Youssef Oulhote, PhD, research associate, Harvard School of Public Health, Boston.

Younger women exposed to chemicals called PBDEs (polybrominated diphenyl ethers) may be at higher risk of having a sluggish thyroid, according to a new study.



(http://www.endocrineweb.com/sites/default/files/imagecache/gallery-large/wysiwyg_imageupload/14572/2015/12/23/flame%20retardant35755454_M.jpg)

PBDEs are flame retardant chemicals, used in textiles, furniture and electronics, among other products. "What we found is, there is a link between exposure to these flame retardants, especially some of them, and the risk of hypothyroidism [abnormally low thyroid function]," says study leader Youssef Oulhote, PhD, research associate at the Harvard School of Public Health.

In the U.S., PBDEs have been phased out of production through voluntary agreements between the makers of the flame retardants and the U.S. Environmental Protection Agency. Yet, the chemicals can **linger for years**

(<http://www.ewg.org/research/healthy-home-tips/tip-4-avoid-fire-retardants>) in products.

Study details

Oulhote and his team looked at 745 women enrolled in the Canadian Health Measures Survey, which includes people ages 6 to 79. For this **study** (<http://press.endocrine.org/doi/10.1210/jc.2015-2659>), he focused in on women ages 30 to 79 who had blood measurements of PBDEs and information on thyroid functioning. They found 90 women who reported they had hypothyroidism, as informed by their doctor, and they used thyroid hormone replacement medication. The researchers find a link between the level of the PBDEs in the blood and low thyroid functioning. The increase in risk depended on the type of PBDEs; they measured 9 different types. "Those with detectable level of BDE100 [one type] were 80 percent more likely to have hypothyroidism than those without detectable levels," Oulhote says. There was no association for one of the PBDEs, he says, and none of the risks were higher than that found for the BDE100.

The **thyroid gland** (<http://www.endocrineweb.com/conditions/thyroid-nodules/thyroid-gland-controls-bodys-metabolism-how-it-works-symptoms-hyperthyroid>) sits low on the front of the neck, secreting hormones that affect metabolism, growth, development and body temperature. Healthy brain development in children relies on healthy thyroid functioning.

The study is published in the *Journal of Clinical Endocrinology and Metabolism*.

Explaining the link

The risk was higher for those ages 30 to 50 than those above 50, the experts found. This makes sense, Oulhote says, because "older women, more than 50, would not have been exposed before puberty," which he believes may be the critical window of susceptibility. The chemicals were very common in the 1970s, when the younger women would have been going through puberty, he says.

While there may be more than one mechanism for how the chemicals trigger thyroid problems, he says, what may happen is that the chemical mimic a thyroid hormone because they are structurally similar. The chemical binds to the receptor meant for the thyroid hormone, in the process disrupting the endocrine system, he speculates.

The chemical-thyroid connection

The new study adds strength to other research, from animal studies, finding a link between the chemical and a thyroid problem, says Yawei Zhang, MD, PhD, MPH, associate professor of environmental health sciences, Yale School of Public Health.

The study cannot prove cause-effect, she says, due to its design, so more research is necessary to confirm these results. Even so, she says, it adds valuable information. Her own research has suggested that elevated PBDEs may increase the risk of thyroid cancer.

The new study follows many other that find PBDEs can disrupt the body's normal hormone balance, says Veena Singla, PhD, staff scientist at the Natural Resources Defense Council, San Francisco. Besides the effect found for the thyroid, she says, "other studies find that exposures to PBDEs in early life, especially before birth, are associated with serious problems like IQ loss, hyperactivity, and low birth weight in children."

Manufacturer's view

The American Chemistry Council, which represents makers of the retardants, contends that the debate is one-sided, and controversy centers on the type of flame retardant, PBDEs, that are largely phased out.

It also maintains that fire protection is important. (<http://flameretardants.americanchemistry.com/FAQs/Fast-Facts-on-Fire-Safety-and-Flame-Retardants-PDF.pdf>)

Consumer action

To minimize your exposure, become a label reader, experts say. In California, a law passed last year states that furniture sold there must have a label telling buyers if the product has the chemicals. "Many companies are including the new California label on their furniture sold throughout the U.S. and Canada," says Singla, "so consumers everywhere should look for the new label and ask the store or manufacturer for a product that does not contain harmful and unnecessary flame retardant chemicals."

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