

Exposure to common flame retardants may raise the risk of papillary thyroid cancer

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Some flame retardants used in many home products appear to be associated with the most common type of thyroid cancer, papillary thyroid cancer (PTC), according to a new study being presented Saturday at the Endocrine Society's 99th annual meeting, ENDO 2017, in Orlando, Fla.

"Thyroid cancer is the fastest increasing cancer in the U.S., with most of the increase in new cases being [papillary thyroid cancer](#)," said the study's lead investigator, Julie Ann Sosa, M.D., MA, professor of surgery and medicine at Duke University School of Medicine in Durham, N.C. "Recent studies suggest that environmental factors may, in part, be responsible for this increase."

Many animal studies have demonstrated that several classes of flame retardants act as endocrine-disrupting chemicals and interfere with [thyroid](#) homeostasis (function), partly because they share a similar chemical structure with [thyroid hormones](#), Sosa said. Therefore, she and her colleagues turned their attention to these flame retardants to study a possible relationship with PTC.

"Our study results suggest that higher exposure to several flame retardants in the home environment may be associated with the diagnosis and severity of papillary thyroid cancer, potentially explaining some of the observed increase in the incidence of thyroid cancer," Sosa said. "This study is novel in that we collected and analyzed individuals' house dust as a measure of exposure to flame retardants."

Levels of flame retardants in house dust significantly correlate with personal exposures, she explained. The researchers collected dust samples from the homes of 140 study subjects: 70 with PTC and 70 individuals without evidence of [thyroid disease](#) or cancer as control subjects. Controls were matched on important characteristics, including age, sex, race/ethnicity, body mass index, household income and education level. Because all participants had lived in their homes for an average of approximately 11 years, Sosa said the researchers could assess long-term average exposure to these environmental chemicals. They also collected participants' blood samples to analyze biomarkers of exposure to several flame retardants in the class known as polybrominated diphenyl ethers (PBDEs).

Just as PTC affects more women than men, most study participants (79 percent) were women, and their average age was 48 years. The investigators reported that higher levels in house dust of two [flame retardants](#) were associated with an increased odds of the home resident having PTC. Those were decabromodiphenyl ether (BDE-209), the most heavily used PBDE, and to a lesser degree, tris(2-chloroethyl) phosphate (TCEP), an organophosphate [flame](#) retardant. Participants whose BDE-209 levels in their dust were high were more than two times as likely to have thyroid [cancer](#) than those individuals with low BDE-209 concentrations.

Participants with high levels of TCEP in their [house dust](#) were more than four times as likely to have larger, more aggressive tumors that extended beyond the thyroid, according to the study. In contrast, participants with the highest [dust](#) levels of BDE-209 were 14 times as likely to be a PTC patient that did not have a common gene mutation (BRAF V600E). This mutation has been linked to PTC that tends to behave more aggressively. "This difference," Sosa said, "begs more interrogation."

Provided by The Endocrine Society

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