# Endocrine-disrupting chemicals may increase odds of women developing mild hypothyroidism

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Exposure to perfluorinated chemicals is linked to changes in thyroid function and may raise the risk of mild hypothyroidism in women, according to a recent study accepted for publication in The Endocrine Society's *Journal of Clinical Endocrinology & Metabolism* (JCEM).

Perfluorinated chemicals, or PFCs, are compounds used to manufacture fabrics, carpets, paper coatings, cosmetics and a variety of other products. Among humans and wildlife, PFC exposure is widespread, according to the National Institutes of Health's National Institute of Environmental Health Sciences. Because these chemicals break down very slowly, it takes a long time for PFCs to leave the body.

"Our study is the first to link PFC levels in the blood with changes in thyroid function using a nationally representative survey of American adults," said one of the study's authors, Chien-Yu Lin, MD, PhD, of En Chu Kong Hospital in Taiwan.

Women who had higher levels of a PFC called perfluorooctanoate (PFOA) in their blood tended to have elevated levels of the thyroid hormone triiodothyronine (T3). The study also found an increase in levels of T3 and the thyroid hormone thyroxine (T4) in women with higher concentrations of the PFC perfluorohexane sulfonate (PFHxS) in their blood. The levels rose without the pituitary gland signaling the thyroid to produce more hormones, which is the body's natural

mechanism for adjusting thyroid hormone levels. Men exposed to higher amounts of PFHxS, however, tended to have lower levels of the T4 hormone.

Even though people with a history of thyroid diseases were excluded from the study, researchers found an association between subclinical, or mild, hypothyroidism and elevated levels of PFOA, PFHxS and perfluorooctane sulfonate (PFOS) in women. Hypothyroidism occurs when the thyroid gland does not produce enough hormones and can cause symptoms such as fatigue, mental depression, weight gain, feeling cold, dry skin and hair, constipation and menstrual irregularities. This relationship needs to be explored and confirmed through additional research, Lin said.

The researchers analyzed data from 1,181 participants in the 2007-2008 and 2009-2010 National Health and Nutrition Examination Survey (NHANES), a population-based survey conducted by the Centers for Disease Control and Prevention (CDC). The study reviewed levels of four different PFCs as well as thyroid function.

"Although some PFCs such as PFOS have been phased out of production by major manufacturers, these endocrine-disrupting chemicals remain a concern because they linger in the body for extended periods," Lin said. "Too little information is available about the possible long-term effects these chemicals could have on human health."

Provided by The Endocrine Society