

BPA shown to disrupt thyroid function in pregnant animals and offspring

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In utero exposure to bisphenol A (BPA) can be associated with decreased thyroid function in newborn sheep, according to a recent study accepted for publication in *Endocrinology*. Hypothyroidism is characterized by poor mental and physical performance in human adults and in children can result in cognitive impairment and failure to grow normally.

BPA, a major molecule used in the plastic industry, has been shown to be an [endocrine disruptor](#) that could exert deleterious effects on human health. Most investigations have focused on [reproductive functions](#), but there is evidence that BPA might have negative effects on other endocrine systems including [thyroid function](#). The current study used sheep, a relevant model for human pregnancy and thyroid regulation and ontogeny, and analyzed the internal exposures of the fetuses and their mothers to BPA and determined to what extent those exposures may be associated with thyroid disruption.

"Our study is the first to show that BPA can alter thyroid function of pregnant animals and their offspring in a long-gestation species with similar regulation of thyroid function as humans," said Catherine Viguié, PhD, of Toxalim, Research Centre in Food Toxicology in Toulouse, France and lead author of the study. "Because of the potential consequences of maternal/fetal thyroid disruption on neural and cognitive development, we think that our study warrants the need for further investigations on the effect of BPA on thyroid function."

This study was conducted on adult ewes that had [multiple pregnancies](#) before being included in the experiment. Some of the pregnant ewes received daily subcutaneous injections of BPA while the remainder were allocated to the control group. Blood samples were taken from jugular blood, amniotic fluid, placenta samples and cord blood to determine levels of BPA, thyroid-stimulating

hormone (TSH) and thyroxine. Results showed that maternal and [fetal exposure](#) to BPA was associated with disruption of thyroid function of both the pregnant ewes throughout pregnancy and the newborns as characterized by a decrease in circulating thyroxine levels.

"BPA concentrations in the mother blood in this experiment were fluctuating between injections from 15 to 1 time the highest blood levels reported in pregnant women in the literature," notes Viguié. "As a consequence, although this study clearly indicates that BPA has the potential to alter thyroid function in living pregnant animals and their offspring, it cannot be considered as fully conclusive in terms of risk for human health in the actual conditions of exposure of human populations."

"In other words, although our study clearly indicates that [BPA](#)-induced thyroid disruption is possible, it does not indicate how probable such a disruption is to occur in real conditions," added Viguié. "Thus, the main merit of our work is to encourage others, including epidemiologists, to scrutinize and qualify carefully such a probability."

More information: The article, "Maternal and fetal exposure to bisphenol A is associated to alterations of thyroid function in pregnant ewes and their newborn lambs," appears in the January 2013 issue of *Endocrinology*.

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