Pregnant Women’s Health Consequences Following Exposure to PBDEs
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BACKGROUND
PBDEs (Polybrominated diphenyl ethers) are chemicals introduced by industry in the 1970s to serve as flame retardants on common consumer products like electronics, plastics, and foam in furniture. They are also suspected to disrupt thyroid activity during a woman’s pregnancy, which is a time of increased demand on the thyroid gland. Maternal thyroid fluctuations and disease as a result of exposure to PBDEs are therefore a concern. This systematic review aimed to capture all of the relevant literature that studied the association between PBDEs and maternal thyroid activity.

METHODS
PBDEs in maternal blood and cord blood measured.

RESULTS
Eight studies did not find statistically significant results for PBDEs and TSH association. Mazdal et al. 2003 did not measure TSH while studies Chevrier et al. 2010 and Zota et al. 2011 found different directions of associations between PBDEs and TSH. Of the studies that measured Free and Total T3, results varied, but there were more negative than positive associations between them and the PBDEs measured. Measuring Free and Total T4, studies were almost split on negative and positive associations. However, it is important to note that when looking across these studies, differences in PBDE congeners presented the statistically significant associations.

There is not a clear consensus in the literature as to which PBDE congeners have a statistically significant association with pregnant women’s thyroid activity and whether that activity is defined as negative or positive. These results need to be replicated through further research before coming to final conclusions. Studies varied in their methods of measuring PBDEs and hormones. Some methods were more robust than others, and funding or time restraints may have played a role here. Future studies should present their results in the context of their measurement methods. Additionally, as discussed earlier, studies varied in their choice of PBDE congeners and hormones to measure. Abdelouahab et al. 2013 chose to include thyroid peroxidase antibodies, for example, which are different indicators of thyroid function. Including more congeners and hormones can give a bigger picture and provide unexpected associations, but may make it more difficult to elucidate individual associations between particular congeners and hormones.

Chevrier, et al. 2010 took PBDE and thyroid measurements around the 27th week of gestation. According to Haddow et al., thyroid function could be of the most importance in the first trimester. In this assessment, studies have shown interesting and significant associations later in pregnancy and at birth. Observing changes in PBDE and thyroid hormone levels over the course of a pregnancy and across multiple studies would tell us more about PBDE and hormone interaction.

Many studies look at PBDEs alongside other chemicals, like PCBs or pesticides. It is possible that PBDEs interact with these factors or other variables, so it is important to control for these covariates. We need to differentiate and understand the effect of PBDEs alone, especially as industry may introduce new chemicals to the market that mimic or replace PBDEs.

REFERENCES