

Exposure of pregnant women to certain phenols may disrupt the growth of boys

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A research consortium bringing together teams from Inserm, the Nancy and Poitiers University Hospitals, and the Centers for Disease Control and Prevention (CDC, Atlanta, USA), and coordinated by the Inserm and University of Grenoble Environmental Epidemiology team (Unit 823), has just published an epidemiological study indicating that exposure to certain phenols during pregnancy, especially parabens and triclosan, may disrupt growth of boys during foetal growth and the first years of life. Bisphenol A was not associated with any definite modification in growth. These results are published in this month's issue of the journal [*Epidemiology*](#), September 2014.

Pregnant women are exposed to several compounds that are widely produced and abundant in our environment. This is the case for parabens (used as preservatives in cosmetics and healthcare products), triclosan (an antibacterial agent and pesticide found in some toothpastes and soaps), benzophenone-3 (used in sun protection products as a UV filter), dichlorophenols (the precursors of which are used in the manufacture of indoor deodorisers), and bisphenol A (the uses of which include manufacture of polycarbonate-based plastics (plastic bottles, CD cases, etc.) and epoxy resins (lining of food cans, dental amalgams) . These compounds belong to the phenol family, and are endocrine disruptors. Experimental studies carried out in vitro and on animals have indicated that these compounds interact with the hormone systems involved in growth and weight gain.

The study was based on 520 boys from the EDEN mother-child cohort

established by Inserm, and supported specifically for the present project by ANSES (French Agency for Food, Environmental and Occupational Health Safety) Pregnant women participating in this cohort were recruited in the Nancy and Poitiers University Hospitals between 2003 and 2006, prior to the present regulations concerning bisphenol A. Growth of each child was assessed by ultrasonography during pregnancy, and by measuring weight and length/height from birth to the age of 3 years. A urine sample taken during pregnancy allowed measurement of biomarkers for exposure to phenols in the CDC Atlanta Environmental Health Laboratory for US biosurveillance programmes.

Results obtained by Rémy Slama, Claire Philippat and colleagues show that over 95% of the [pregnant women](#) were exposed to these substances, and that maternal exposure to some phenols may disrupt the growth of boys. More specifically, the researchers showed a negative correlation between triclosan levels and growth parameters measured at the ultrasound examination in the third trimester of pregnancy, and that parabens were associated with increased weight at birth and at three years. It is known that accelerated growth in the first years of life may increase the risk of obesity in later childhood. The study did not identify any clear link between urinary concentrations of other phenols and ante- and postnatal growth of boys. Because the urinary concentration of bisphenol A varies widely, it was not quantified accurately in the present study, which relied on a single urine sample for each woman.

For the researchers, "this is the first study concerning these environmental contaminants based on growth data collected during pregnancy, at birth, and up to the age of three years. Previous studies were focused on just one of these periods, and were usually restricted to the study of bisphenol A, without including other phenols."

The research teams will now try to repeat these results for a new couple-child cohort (the SEPAGES cohort), for which numerous urine samples

will be collected from each participant (mother and newborn) during [pregnancy](#) and the child's first few years of life. This approach will make it possible to reduce errors in exposure measurement, and to identify the potential periods of greatest influence of phenols on the growth of children during childhood. Girls, whose sensitivity to phenols may differ from that of boys, will also be considered in this new couple-child cohort.

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