

PCBs, other pollutants may play role in pregnancy delay

November 14 2012

Couples with high levels of PCBs and similar environmental pollutants take longer to achieve pregnancy in comparison to other couples with lower levels of the pollutants, according to a preliminary study by researchers at the National Institutes of Health and other institutions.

PCBs (polychlorinated biphenyls) are chemicals that have been used as coolants and lubricants in electrical equipment. They are part of a category of chemicals known as persistent organochlorine pollutants and include [industrial chemicals](#) and chemical byproducts as well as pesticides. In many cases, the compounds are present in soil, water, and in the food chain. The compounds are resistant to decay, and may persist in the environment for decades. Some, known as persistent lipophilic organochlorine pollutants, accumulate in fatty tissues. Another type, called perfluorochemicals, are used in clothing, furniture, adhesives, food packaging, heat-resistant non-stick cooking surfaces, and the insulation of electrical wire.

Exposure to these pollutants is known to have a number of effects on human health, but their effects on human fertility— and the likelihood of [couples](#) achieving [pregnancy](#)— have not been extensively studied.

"Our findings suggest that persistent organochlorine pollutants may play a role in pregnancy delay," said the study's first author, Germain Buck Louis, Ph.D., director of the Division of Epidemiology, Statistics, and Prevention Research at the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) at NIH.

Dr. Buck Louis added that individuals may limit their exposure by removing and avoiding the fat of meat and fish, and by limiting the consumption of animal products.

The study was published online in [Environmental Health Perspectives](#) and is available online at <http://ehp.niehs.nih.gov/2012/11/1204996/> In addition to researchers at the NICHD, the study also included investigators from the Texas A&M Health Science Center, College Station, The Ohio State University, Columbus, Emory University, Atlanta, and The EMMES Corp., Rockville, Md.

To conduct the study, the researchers enrolled 501 couples from four counties in Michigan, and 12 counties in Texas, from 2005 to 2009. The couples were part of the Longitudinal Investigation of Fertility and the Environment (LIFE) study, established to examine the relationship between fertility and exposure to environmental chemicals and lifestyle. An earlier analysis from the LIFE study found that high blood levels of lead and cadmium also were linked to pregnancy delay.

The women taking part in the study ranged from 18 to 44 years of age, and the men were over 18. Couples provided blood samples for the analysis of organochlorines (PCBs) and perfluorochemicals (PFCs). Women kept journals to record their monthly menstrual cycles and the results of home pregnancy tests. The couples were followed until pregnancy or for up to one year of trying.

The researchers calculated the probability that a couple would achieve pregnancy by using a statistical measure called the fecundability odds ratio (FOR). The measure estimates couples' probability of pregnancy each cycle, based on their blood concentration of the compounds. A ratio less than one suggests a longer time to pregnancy, while a ratio greater than one suggests a shorter time to pregnancy.

The researchers examined PCB congeners, which are single, unique well-defined chemical compounds in the PCB category.

The lowest FORs were seen for couples in which the females were exposed to PCB congener 167 (FOR 0.79); and in which the males were exposed to PCB congener 138 (FOR=0.71).

For each standardized increase in chemical concentration the researchers measured, the odds of pregnancy declined by 18 to 21 percent for females exposed to PCB congeners 118, 167, 209, and the perfluorochemical, perfluorooctane sulfonamide. Perfluorooctane sulfonamide is one of a broad class of compounds known as perfluoroalkyls, which have been used in fire fighting foams.

With increasing exposure, the odds for pregnancy declined by 17 to 29 percent for couples in which males were exposed to PCB congeners 138, 156, 157, 167, 170, 172, and 209 and to DDE, produced when the pesticide DDT degrades in the environment. DDT is banned for use in the United States, but is still used in some countries.

The investigators noted that they cannot rule out that some of the delays they observed may have been due to exposure to multiple chemicals. They added that these associations would need to be confirmed by other researchers.

Provided by NIH/National Institute of Child Health and Human Development

Citation: PCBs, other pollutants may play role in pregnancy delay (2012, November 14) retrieved 18 April 2024 from

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