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Evidence mounts for effects of PCBs on baby weight

Studies investigating the effects of pregnant women's low level exposure to polychlorinated biphenyls (PCBs) on the weight of their newborn babies have produced conflicting results. However, new research, which involved 8000 pregnant women across Europe, adds to the mounting body of evidence that PCB exposure does in fact reduce birth weight.

During the 20th century, organic chemicals containing chlorine were manufactured in large quantities, before being banned in many countries. PCBs are very stable compounds that were used extensively in non-flammable or fire-resistant fluids for electrical equipment. There are many different PCB 'congeners' – chemical variants distinguished by the number and positioning of chlorine atoms. Another persistent organic pollutant (POP) of concern is DDT, an insecticide that is used, even today in some countries, to control malaria. It breaks down in the body to produce dichlorodiphenyldichloroethylene (DDE). These industrial chemicals accumulate in food chains and human tissues, where they can remain for many years.

With their toxicity and probable carcinogenic effects, the release of PCBs, DDT and other POPs into the environment is now heavily restricted in Europe and internationally[1], and their presence is falling. However, they can still be detected in blood samples. There is particular concern over pregnant mothers who have been exposed to PCBs, as some studies have suggested that the chemicals reduce birth weight. However, the available evidence for this is conflicting.

This study, conducted under two large EU-funded projects, ENRIECO and OBELIX[2], examined samples of breast milk and umbilical cord blood, as well as maternal blood from pregnant mothers. Just under 8000 women who gave birth between 1990 and 2008 were involved in the studies. The samples were analysed for the presence of the PCB congener 153 and for DDE.

The results reveal a link between PCB concentration and the weight of the newborn baby. On average, birth weight was 150g lower for each 1 microgram per litre increase in the concentration of PCB measured in cord blood. In contrast, the effects of DDE on birth weight were not statistically significant overall.

The researchers say that the results add to 'mounting evidence' of a link between low dose exposure to PCBs and birth weight. The effects of PCB 153 exposure on birth weight are equivalent to the effects of a pregnant mother smoking 10 cigarettes a day, it is suggested.

Although it is not known exactly how PCB slows the growth of the foetus, the study speculates that endocrine disrupting actions – which interfere with hormones – could be to blame. In particular, some previous studies have shown that PCBs can interfere with oestrogens, which are important for growth in the womb.

1. See: http://ec.europa.eu/environment/waste/pcbs/index.htm and http://ec.europa.eu/environment/pops/index_en.htm
2. Environmental Health Risks in European birth Cohorts (ENRIECO) and Obesogenic Endocrine disrupting chemicals: Linking prenatal exposure to the development of obesity later in life (OBELIX) are supported by the European Commission under the Seventh Framework Programme. See: www.enrieco.org and www.theobelixproject.org

Source: Govarts, E. Nieuwenhuijsen, M., Schoeters, G. *et al*. (2011). Prenatal Exposure to Polychlorinated Biphenyls (PCB) and Dichlorodiphenyldichloroethylene (DDE) and Birth Weight: A Metaanalysis within 12 European Birth Cohorts. *Environmental Health Perspectives*. DOI: 10.1289/ehp.1103767. This study is free to view at: http://ehp03.niehs.nih.gov/article/info%3Adoi%2F10.1289%2Fehp.1103767

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