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Concentration of Persistent Organic Pollutants drops between 34% and 56% in the inhabitants of Barcelona

It is the first time that the temporary evolution of the concentration of persistent organic pollutants in humans is studied with a representative sample and using the same method

Barcelona, 13 March 2012- A study lead by the IMIM (Hospital del Mar Research Institute) and the Barcelona Public Health Agency (ASPB) has shown that the level of Persistent Organic Pollutants (POPs) in blood has dropped significantly in the inhabitants of Barcelona between the years 2002 and 2006. This drop could be due to factors such as the entry into force of several regulations over the course of past years, among others. These regulations have not only lead to prohibiting certain products used in industry, but also avoiding polluting emissions such as the ones generated by incinerating waste.

“The data in the study show that the presence of polychlorinated biphenyls (PBC, of an industrial origin) in the blood of the inhabitants of Barcelona dropped between 34% and 56% compared to 2002; the levels of DDT (an insecticide prohibited over 30 years ago) dropped 39%, and the level of its main metabolite, DDE, dropped 53%. Hexachlorobenzene (a fungicide) and beta-hexachloro-cyclohexane (a compound related to insecticide Lindane) dropped 53% and 50%, respectively. The magnitude of these decreases in body levels of organic pollutants was similar in both women and men, and was slightly higher for younger persons and larger for obese people” explains Miquel Porta, the main signatory of the article coordinator of the clinical and molecular epidemiology of cancer research group of IMIM and Professor at the UAB.

The results of the study are coherent with the data that the Barcelona public health services has already documented on the improvement of the presence of persistent pollutants in food, taken from the works done annually by the Public Health Agency in the IQSA Programme to investigate the health quality of food products.

“Despite this decrease, the results also show that 8 out of the 19 pollutants analyzed are present in over 80% of the participants in this study and that none of them were free of persistent pollutants. The lowest number of POPs detected in a person was 5 and the highest was 15; 72% of the population of Barcelona has at least 10 of these pollutants. These data are, to a great extent, transposable to other Spanish populations”, points out Miquel Porta.

Persistent Organic Pollutants (POPs) are a group of chemical products grouped into organochlorinated pesticides, PCBs, etc. They are manufactured by man and have a very long persistence on the environment and living beings. In Spain, most of the pollutants analyzed in this study stopped being used in the 1970s, but their resistance to degrading means they are still present today. In humans, POPs enter through the food supply chain and accumulate in fat tissue and body organs such as the liver, brain or pancreas. There are several studies that suggest that these compounds could contribute to the causes of several diseases such as alterations of the endocrine system, diabetes, several forms of cancer, and neurological, gynaecological and immunological disorders. It is therefore likely that POPs may explain a large part of the burden of illness in today's society.

This work has been carried out with the results obtained from the Barcelona Health Survey carried out by the Barcelona Public Health Agency (ASPB) in 2006, integrating the analysis of POPs. 231 personal interviews were conducted with participants, taking a blood sample of each and doing a physical examination. The results obtained were compared with the results from a sub-sample of individuals from the city of Barcelona from the Catalan Health Survey from 2002, which also included a study on persistent pollutants. Chemical analyses were carried out at the *Centro Superior de Investigaciones Científicas* (CSIC). This is the first time in Spain that the trends of POP levels are studied with a representative sample and using the same method, which is also extremely rare in the world.

The study points out that **among Barcelonans there are large differences in the blood concentrations of these pollutants. The reasons behind these inter-individual differences in body impregnation of these organic pollutants are not clear, even if they usually increase with age and weight. It is not yet known why this impregnation is higher in women than in men.**

“Several regional, national and international legislations, such as the Spanish General Public Health Act and the Stockholm Convention, establish that governments shall monitor and control internal pollution by environmental compounds. That is why studies such as the one carried out in Barcelona are so important, by studying the evolution of organic pollutants in representative samples of populations, which helps to assess the effectiveness of the policies being implemented to reduce the exposure of the population”, says Miquel Porta.

Article of reference

“Distribution of blood concentrations of persistent organic pollutants in a representative sample of the population of Barcelona in 2006, and comparison with levels in 2002”Miquel Porta, Tomàs López, Magda Gasull, Maica Rodríguez-Sanz, Mercè Garí, José Pumarega, Carme Borrell, Joan O. Grimalt. *Science of the Total Environment*. DOI: 10.1016/j.scitotenv.2012.02.001 (<http://dx.doi.org/10.1016/j.scitotenv.2012.02.001>)

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