

Low-dose exposure of environmental contaminants can be harmful to the human brain

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Individuals subjected to chronic low-dose exposure to organochlorine pesticides show and increased risk to obtain a future diagnosis of cognitive impairment. This is shown in a study now published in *Environmental International*.

Organochlorine pesticides (OCPs) are a group of environmental contaminants that were banned in developed countries 20-30 years ago. But since they accumulate through the food chain and remain for a very long time in the human body, especially [adipose tissue](#), high levels can still be found in a majority of the population of Sweden, as well as in most other industrial countries. The most commonly known of these compounds is the pesticide DDT.

The research group at Uppsala University has previously shown associations between [environmental contaminants](#) and diabetes, atherosclerosis and stroke (links below, if needed). Using the same large data set they have now shown that the OCPs are related to future cognitive impairment.

The so-called PIVUS study (Prospective Investigation of Uppsala Seniors) comprises around 1,000 70-year-olds in Uppsala who have been studied over a longer period of time. The researchers measured three different OCPs in plasma from the individuals and investigated who received a diagnosis of cognitive impairment over the coming 10-year period.

The results show that individuals with high levels of three OCPs (p,p'-DDE (a metabolite of DDT), transnona-chlordane and hexachlorobenzene) had about 3 times higher future risk of [cognitive impairment](#) than elders with low levels of OCP. These results are independent of factors such as sex, smoking, diabetes, exercise habits, alcohol

intake, weight change and [high blood pressure](#).

- Even though OCPs are well-known neurotoxins, our findings are surprising because current exposure levels of these chemicals are very low. However, our study subjects were the first generation with almost life-time exposure to these chemicals. Thus, we found evidence that low-dose, but chronic, [exposure](#) of OCPs can be harmful to the human brain, says Lars Lind, Professor of Medicine at Uppsala University.

More information: Duk-Hee Lee et al. Association between background exposure to organochlorine pesticides and the risk of cognitive impairment: A prospective study that accounts for weight change, *Environment International* (2016). [DOI: 10.1016/j.envint.2016.02.001](https://doi.org/10.1016/j.envint.2016.02.001)

Provided by Uppsala University

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