New Evidence on Harmful Effects of POPs

High consumption of fatty fish from Baltic Sea is the major source of persistent organic pollutants (POPs) in Sweden. A recent assessment of the links between blood levels of POPs and the prevalence of diabetes in Swedish fisherman and their wives provide epidemiological support that POP exposure may increase risk of diabetes in such high exposure cohorts.

Persistent organic pollutants (POPs) are chemical substances that persist in the environment, have a wide geographical distribution, bioaccumulate through food webs, and pose a risk of causing adverse effects to human health and the environment. This group of priority pollutants consists of pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial processes (such as dioxins and furans).

EU member states have committed to take measures to eliminate or reduce the release of POPs into the environment by ratifying the global POPs treaty, known as The Stockholm Convention. However, because of their high environmental persistence and capacity to accumulate in fatty tissues of living organisms, the exposure to these substances is expected to persist in the future, with the food chains as main routes of exposure.

In Sweden, consumption of fatty fish from the Baltic Sea, off the Swedish east coast, is the single major exposure source for POPs. Cohorts of professional fishermen and their families from the Swedish east coast have been found to constitute excellent study bases for epidemiological evaluations of human health effects of POPs.

Since recent experimental studies suggest that exposure to POPs, mainly dioxins and PCBs may cause diabetes in humans, Swedish researchers have recently conducted an epidemiological study aiming at assessing the links between serum levels of POPs and prevalence of diabetes in Swedish fisherman and their wives, with high consumption of fatty fish from the Baltic Sea.

The concentrations of the main markers for POPs (PCB Congener CB 153, and pp'DDE - main metabolite of DDT) were measured in serum samples of 196 men (median age 60 years) and 184 women (median age 64 years). The participants were interviewed using a standardized health situation questionnaire. Six percent of men and five percent of women had diabetes.

After adjustment for potential confounders (i.e. gender, current age, body mass index) the results have shown that diabetics had significantly higher serum levels of both POPs markers compared to non-diabetic control subjects. These findings support the hypothesis that POP exposure might contribute to diabetes in humans.

The authors highlight that they cannot exclude the possibility of a reversed causality, meaning that it is the disease that effects the levels of POPs and not vice versa. However, they suggest that the observed negative correlation could support the hypothesis of POPs as risk factors.

Besides giving epidemiologic insight into the potential adverse effects of POPs for human health, this study also provides the scientific support to the recent efforts of the EU in taking measures to reduce PCBs in food and feed in order to ensure the health safety of EU consumers.


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