POLYCHLORINATED BIPHENYLS AND ORGANOCHLORINE PESTICIDES PREDICT DEVELOPMENT OF TYPE 2 DIABETES IN THE ELDERLY: THE PROSPECTIVE INVESTIGATION OF THE VASCULATURE IN UPPSALA SENIORS (PIVUS) STUDY

Duk-Hee Lee, *Kyungpook National University, Korea.,*
P Monica Lind, *Uppsala University, Sweden.,*
David R Jacobs, Jr, *University of Minnesota, U.S.,*
Samira Salihovic, *Örebro University, Sweden.,*
Bert van Bavel, *Örebro University, Sweden.,*
Lars Lind, *Uppsala University, Sweden.*

Background and Aims: Persistent Organic Pollutants (POPs), lipophilic chemicals that accumulate mainly in adipose tissue, has recently been linked to type 2 diabetes. However, evidence from prospective studies is sparse. This study was performed to evaluate prospective associations of type 2 diabetes with plasma concentrations of selected POPs among the elderly.
Methods: Twenty POPs (including 15 polychlorinated biphenyl (PCB) congeners, 3 organochlorine (OC) pesticides, 1 brominated diphenyl ether (BDE), and 1 dioxin) were measured in plasma collected at baseline in 725 participants aged 70 years of the Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS).
Results: After adjusting for known risk factors of type 2 diabetes including obesity, odds ratios (ORs) for incident type 2 diabetes (n=36) according to quintiles of a summary measure of plasma concentrations of PCBs (vs. the lowest quintile) were 4.5, 5.1, 8.8 (95% CI: 1.8-42.7), and 7.5 (1.4-38.8) (P_{trend} <0.01). Among 3 OC pesticides, adjusted ORs across concentrations of trans-nonachlor showed P for trend=0.03. Adjusted ORs across quintiles of the sum of 3 OC pesticides were 1.1, 1.6, 1.5, and 3.4 (1.0-11.7) (P_{trend} =0.03). Neither BDE47 nor dioxin was significantly associated with incident diabetes. The strength of prediction of incident diabetes was stronger for the sum of PCBs than it was for BMI or waist circumference. The sum of PCBs improved reclassification significantly when added to traditional risk factors for diabetes.
Conclusions: This study found that environmental exposure to some POPs substantially increased risk of future type 2 diabetes in an elderly population.