HYPOINSULINEMIA IN THE PATHOGENESIS OF PCB-INDUCED TYPE 2 DIABETES

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Background and aims: Some persistent environmental chemicals are suspected of causing an increased risk of type 2 diabetes mellitus. We examined early stages of diabetes development in the elderly of a fishing population with elevated exposure to marine contaminants.
Methods: In 713 Faroese residents aged 70-74 years (64% of eligible population), we determined fasting plasma concentrations of glucose and insulin and the relative concentration of glycosylated hemoglobin. Lifetime exposure to persistent environmental chemicals from pilot whale and other traditional food was determined from dietary questionnaire and by analysis of blood samples for polychlorinated biphenyls (PCBs) and other food contaminants.
Results: Septuagenarians with type 2 diabetes or impaired fasting glycemia tended to have higher PCB concentrations and higher past intakes of traditional food. In non-diabetic subjects, the fasting insulin concentration decreased by 7% (95% CI: -12, -2.1) for each doubling of the PCB concentration after adjustment for sex and body mass index at age 20. Conversely, the fasting glucose concentration in these subjects increased by 6%; (95% CI: -1, 13) for each doubling in PCB.
Conclusions: Exposure to persistent lipophilic food contaminants may contribute to the development of type 2 diabetes through impaired insulin secretion.