DIOXIN-LIKE ACTIVITIES IN SERUM ACROSS EUROPEAN AND INUIT POPULATIONS

Long M[1], Andersen BS[1], Lindh CH[2], Hagmar L[2], Giwercman A[3], Manicardi GC[4], Bizzaro D[5], Spanò M[6], Toft G[7], Pedersen HS[8], Zvyezday V[9], Bonde JP[7], Bonefeld-Jorgensen EC[1]

[1] Unit of Cellular & Molecular Toxicology, Department of Environmental and Occupational Medicine, Institute of Public Health, University of Aarhus, Vennelyst Boulevard 6, DK-8000 Aarhus C, Denmark; [2]Department of Occupational and Environmental Medicine and Psychiatric Epidemiology, University Hospital, SE-221 Lund, Sweden; [3]Fertility Centre, Malmö University Hospital, Lund University, Malmö, SE-205 02 Sweden; [4]Laboratory of Genetics, Department of Agricultural Sciences, University of Modena and Reggio Emilia, Viele Kennedy 17 – Reggio Emilia I-41100 Modena, Italy; [5]Institute of Biology and Genetics, Politechnical University of Marche, Via Brecce Bianche 1-60131 Ancona, Italy; [6]Section of Toxicology and Biomedical Sciences, BIOTEC-MED, ENEA Casaccia, Via Anguillarese 301, 00060 Rome, Italy; [7]Department of Occupational Medicine, Aarhus University Hospital, Nørrebrogade 44, build. 2C, DK-8000 Aarhus C, Denmark; [8]Center for Arctic Environmental Medicine, postbox 570DK-3900 Nuuk, Greenland, Denmark; [9]Laboratory of Human Reproduction, Kharkiv State Medical University, Klochkovskaya Street 156-A, room 14, 61145 Kharkiv, Ukraine

Introduction

Persistent organic pollutants (POPs) such as polychlorinated dibenzo-p-dioxins/furans, polychlorinated biphenyls (PCBs) and organochlorine pesticides can cause a series of adverse effects on e.g. reproduction in animals and humans, many of which involve the aryl hydrocarbon receptor (AhR). The aim of the present study was to compare the integrated serum level of AhR mediated activity among European and Inuit populations, and evaluate whether the activity was associated to the selected POP markers, 2,2',4,4',5,5'-hexachlorobiphenyl (CB-153) and 1,1-dichloro-2,2-bis(p-chlorophenyl)-ethylene (*p,p'*-DDE).

Materials and Methods

The study included 338 males from Greenland (Inuit's), Sweden, Warsaw (Poland) and Kharkiv (Ukraine). The AhR transactivity of serum extracts alone (AhRag) and competitive AhR activity (AhRcomp) upon co-exposure with 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) were determined in the lipophilic serum fraction containing the POPs using the AhR mediated luciferase reporter Hepa1.12cR cell assay[1].

Results and Discussion

The European groups showed higher median level of AhR-TEQ (TCDD toxic equivalents) compared to the Inuit's, whereas higher incidence of Inuits sample further induced AhRcomp activity. Neither AhRag nor AhR-TEQ were correlated to CB-153 or *p,p'*-DDE for any of the study groups. Multiple regressions showed a significant heterogeneity of association between the CB-153 and the AhRcomp across the study groups, and accordingly a negative association between AhRcomp and CB-153 was found for the Kharkiv group.

No consistent correlation between AhR activities and two POP markers was found. Although the difference of AhRag between European and Inuit men could not be explained by CB-153 or *p,p'*-DDE levels alone, we believe that the variation of AhR serum activity reflects different pattern of POP exposure, genetics and/or life style factors.

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