

A NESTED CASE-CONTROL STUDY OF INTRAUTERINE EXPOSURE TO PERSISTENT ORGANOCHLORINE POLLUTANTS IN RELATION TO RISK OF HYPOSPADIA

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Background and aims: In western countries the prevalence of hypospadias varies from two to eight cases per 1,000 live births. Knowledge about risk factors for hypospadias is still scarce. However, environmental exposures to so called endocrine disrupting chemicals (EDCs) have been suggested as a risk factor. An important group of EDCs is persistent organochlorine pollutants (POPs). Due to the unique personal identification number present in the biobank databases and the national health registries in Sweden we have the possibility to investigate the association between POPs and hypospadias in relatively large studies.

Methods: The Malmö Microbiology Biobank (MMB) contains about 200 000 deep-frozen serum samples, stored after population-based serological screening for virus infections and rubella immunity during pregnancy week 14. Linkages between the Medical Birth Register, the Malformation Register and the In-patient Register resulted in 390 boys with hypospadias. For 237 (61 %) of them, sufficient amount of serum samples were found in the biobank. For each case a control boy was randomly selected from the MMB.

2,2',4,4',5,5'-hexachlorobiphenyl (PCB-153), the major DDT metabolite 1,1-dichloro-2,2-bis (*p*-chlorophenyl)-ethylene (*p,p'*-DDE) and hexachlorbenzene (HCB) were used as biomarkers of POP exposure.

Results: A 65 percent statistically significantly increased risk in the highest maternal exposure quartile of HCB as compared to the three lowest HCB exposure categories was observed. The pattern was, although not statistically significant, similar for maternal exposure for *p,p'*-DDE.

Conclusion: The present study indicates that *in utero* exposure to HCB and perhaps exposure to *p,p'*-DDE is a risk factor for hypospadias. The fact that HCB and *p,p'*-DDE may affect the androgen-signalling pathway should reinforce the concept that EDCs, though present at low doses, may affect human health negatively.