

PRENATAL EXPOSURE TO ORGANOCHLORINE COMPOUNDS (OCs) IN RELATION TO BIRTHWEIGHT AND DURATION OF GESTATION: THE SPANISH INMA PROJECT

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Background and aims: To evaluate associations between prenatal organochlorine compounds (OC) exposure and birthweight and duration of gestation in a population with low exposure levels.

Methods: The analysis included 1527 mother-child pairs from three sub-cohorts of the INMA project (www.proyectoinma.org) recruited during pregnancy between 2003-2008. Polychlorinated biphenyls (PCBs 138, 153, 180 and the total), p,p'-dichlorodiphenyldichloroethylene (p,p'-DDE), hexachlorobenzene (HCB) and •-hexachlorocyclohexane were measured in maternal serum obtained in weeks 10-13 of gestation. Multivariable linear regression was used to assess the association between the exposure to these compounds and birthweight and gestation duration adjusting for potential confounders.

Results: The mean (sd) gestational age was 39.7 (1.6) weeks and mean birthweight 3254.8 (465.7) grams. After multivariate adjustment including other OCs, the increase levels of p,p'-DDE were significantly negatively associated with gestation duration among male infants ($\beta = -0.129$; 95%CI: -0.251 to -0.007), but not among females. Among infants of both sexes whose mothers smoked during pregnancy (31.7% of the sample), p,p'-DDE was also associated with shorter gestation duration after multivariable adjustment ($\beta = -0.192$; 95%CI: -0.356 to -0.028) and PCBs were associated with significant reductions in birthweight among infants ($\beta = -50.474$; 95%CI: -99.442 to -1.506); these associations were marginally non-significant after adjusting for other OCs. When OCs were categorized in quartiles, the main differences were found between the first and the fourth quartile (p,p'-DDE: $\beta = 0.43$ vs. >0.16 $\mu\text{g/L}$; PCBs: $\beta = 0.43$ vs. >0.91 $\mu\text{g/L}$).

Conclusions: Results suggest infants of women who smoke during pregnancy may be vulnerable to adverse effects of low-level p,p'-DDE exposure on the duration of gestation and to effects of PCB exposure on birthweight. Overall, boys also appeared to be more susceptible than girls to negative effects of p,p'-DDE on the duration of gestation.