

LONG TERM EXPOSURE TO ORGANOCHLORINE PESTICIDES AND THYROID HORMONE LEVELS IN CHILDREN FROM CIDADE DOS MENINOS, RJ, BRAZIL

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Background and Aims: Disruption of thyroid hormone (TH) homeostasis by organochlorine compounds (OCs) has been demonstrated in several animal studies. However, a consistent association has not been established yet in humans. We aimed to investigate the effect of exposure to OC pesticides on TH levels in children from Cidade dos Meninos village (Duque de Caxias municipality, RJ, Brazil), an area highly contaminated with OC pesticides since 1961.

Methods: Serum concentration of 19 OC pesticides (HCH, HCB, DDT and others) and TH levels (free T4 [fT4], total T3 [tT3] and TSH) were measured in 193 children <15 years of age from Cidade dos Meninos. Linear regression was conducted to examine differences in TH levels according to quintiles of OC exposure, controlling for age, gender and serum lipid content.

Results: Children presented high prevalence and exposure levels of most of the pesticides; fT4 and TSH levels were within reference values, whereas tT3 was above the reference range (>180 ng/dL) in 28% of the children. Excepting for heptachlor and methoxychlor, tT3 levels showed an increasing linear trend ($p < 0.05$) across pesticide exposure categories. Increased fT4 was only related to *p,p'*-DDD, endosulphan I, and dieldrin levels. No significant trend was found for TSH.

Conclusions: Contrary to what has been generally reported in the literature, a consistent increase in tT3 according to OC exposure was observed. Positive associations between OCs and T3 or T4 levels has been scarcely reported, as mentioned according to *p,p'*-DDE and tT3 among adults (Meeker et al., 2007). Long-term continuous exposure to high OC pesticide levels in Cidade dos Meninos has probably generated a quite different exposure setting than that dealt in other studies. Hence, we hypothesize that the thyroid metabolism in children continuously exposed in utero and afterwards to high OC pesticides levels can respond similarly as reported among exposed adults.

Meeker JD, Altshul L, and Hauser R. Serum PCBs, *p,p'*-DDE and HCB predict thyroid hormone levels in men. *Environ Res* 2007;104:296-304.