

HORMONAL CHANGES ASSOCIATED WITH DDT UPTAKE IN YOUNG MALES

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Introduction: The data of a cross-sectional study evaluating male fertility parameters in apparently healthy young men from Limpopo exposed to DDT, mainly from Indoor Residual Spraying (IRS) was analyzed to test for an association between DDT isomers and male hormone levels.

Method: Complete data on plasma DDT isomers, serum total testosterone (t-T) and sub-fractions, estradiol, LH, FSH, albumin and SHBG were available for 198 men - mean (SD) age 23(4) years. Information on life style, anthropometry and exposure to other pesticides was sourced from the questionnaire. Data was normalize using appropriate transformations where indicated. Only hormones significantly correlated with any DDE or DDT isomer ($p < 0.2$) were further analyzed through linear regression models. Following bivariate linear regression analyses all independent variables having a statistical association ($p < 0.15$) were included in an initial multiple linear regression model for each hormone as dependent variable. A manual stepwise elimination process was followed and variables with a 95% confidence interval not including zero or that changed other coefficients $> 10\%$, were kept in the final models. DDT or DDE isomers were introduced separately in each final model keeping the other predictors constant.

Results: Maximum levels for p,p'-DDE, o,p'-DDT and p,p'-DDT were: 997, 42 and 519 $\mu\text{g/g}$ lipid, respectively. Fifty-five percent of subjects reportedly used pesticides and 43% smoked cigarettes (mean two/day for three years). Median (range) t-T and % free-T (%f-T) were 24.1(7.0, 53) nmol/L and 2% (0.6, 3.4%) respectively. Concentrations above reference values were observed for estradiol (27%), SHBG (25%) and bio-available testosterone (bio-T) (36%). Total-T, f-T and bio-T were explained by one or more of the DDT/DDE isomers, as well as other variables (adjusted R^2 0.07, 0.06 and 0.05).

Conclusions: The results suggest that exposure to DDT from IRS may be associated with altered sex hormone homeostasis in young men.