

Exposure-effect relationships in Flemish adolescents

Nik Van Larebeke

**Ghent University, Study Centre for Carcinogenesis and Primary Prevention of Cancer,
Department of Radiotherapy and Nuclear Medicine**

Three biomonitoring campaigns were organised by the Flemish Expertise Centre on Environment and Health; one in the whole of Flanders, one around the industrial area of Genk Zuid and one in the Menen area. For a total of 606 adolescents (aged 14 to 15), internal exposure to a series of pollutants and a series of parameters of biological and health effects was measured or assessed through questionnaires. Many significant associations were noted. In this presentation we present data on the statistically significant association of DNA damage with internal exposure to:

- the heavy metals chrome, Cadmium, Thallium and Arsenic,
- Polycyclic Aromatic Hydrocarbons (measured through assessment of the urinary concentration of the metabolite 1-hydroxypyrene)
- Phthalates (plastic softeners) measured through urinary concentrations of metabolites
- Organophosphorous insecticides measured through urinary concentrations of metabolites
- the perfluorinated substance Perfluoro-octanoic acid (PFOA).

Also statistically significant associations of early biomarkers of renal damage with internal exposure to the heavy metals Arsenic, Chrome, Thallium and Nickel were observed.

In addition, we will report on statistically significant positive associations of internal exposure to Phthalates with:

- Asthma
- Allergy to animals
- Development of the breasts in girls
- Development of pubic hair in girls
- DNA damage (number of breaks) measured through the comet assay
- DNA damage (DNA adducts derived from oxidation or alkylation) (fpg comet assay)
- The number of eosinophils in peripheral blood
- Excretion of 8-hydroxy-deoxyguanosine (a marker of oxidative DNA damage)
- Blood concentration of Sex Hormone Binding Globulin (SHBG)

A statistically significant negative association was observed between urinary concentrations of metabolites of Bis(2-ethylhexyl)phthalate (DEHP) and genital development in boys.

Associations of sex and thyroid hormones with different Phthalate metabolites will be reported.