

PREDICTORS OF ENVIRONMENTAL EXPOSURE TO POLYCYCLIC AROMATIC HYDROCARBONS AMONG PREGNANT WOMEN

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Background and Aims: Polycyclic aromatic hydrocarbons (PAH) are a group of compounds, comprising two or more fused aromatic rings, that are formed as a result of incomplete combustion of organic matter. Sources of environmental contamination can be both industrial and nonindustrial, the most common sources being cigarette smoke, grilled and smoked food processes, coal-fired utilities, steel plants, coke-oven plants, graphite electrode manufacturing plants, vehicle exhaust, wood-burning ovens and fireplaces. The aim of the study was to characterize the PAH exposure level based on 1-hydroxypyrene (1-HP) in urine of Polish pregnant women.

Methods: The study population consisted of 449 pregnant women who had been the subjects of the prospective Polish Mother and Child Cohort study performed in 8 regions of Poland. The women were interviewed three times during pregnancy (once in each trimester). 1-HP concentration in urine was chosen as the biomarker of exposure to PAH. The urine sample was analysed using high performance liquid chromatography (HPLC). The active and passive smoking exposure was verified by saliva cotinine, analysed by high performance liquid chromatography coupled with tandem mass spectrometry/positive electrospray ionisation (LC-ESI⁺MS/MS) and isotope dilution method.

Results: 1-HP concentration in urine ranged from 0.02 to 10.2 •g/g creatinine with the geometric mean (GM) 0.4 •g/g creatinine. The significantly higher concentration of urinary 1-HP in pregnant women was observed for summer collection (GM ratio 1.1; $p = 0.01$), among smokers (GM ratio 1.7; $p < 0.001$) and for the women living in big cities (GM ratio 1.3; $p = 0.001$).

Conclusions: The significantly higher concentration of urinary 1-HP in pregnant women was observed for summer collection, among smokers and those living in big cities.