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Effect of Environmental Exposure to PAHs on Somatic Chromosomes


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Abstract: Polycyclic aromatic hydrocarbons (PAHs) are one of the main environmental pollutants in urban areas. Cytogenetic analysis of chromosomal aberrations is of great concern as they are involved in the mechanism of carcinogenesis. The aim of this study was to assess the genotoxic effect of occupational exposure to PAHs in a group of 30 Bulgarian traffic policemen compared to 30 office clerks. Structural and numerical chromosome aberrations were analyzed by the conventional method in 100 to 300 cells per person. The exposure assessment was performed by personal sampling of air in the respiratory area. PAHs were identified by high performance liquid chromatography (HPLC) with a fluorescent detector. SPSS 8.0 and Statistica 4.3 were used for statistical analysis of the results. The frequency of chromosomal aberrations in peripheral blood lymphocytes was higher in the occupationally exposed policemen - 2.55% than in the control group 1.57% ($P < 0.002$). The exposure to PAHs varied from 24.69 ng/m³ to 203.97 ng/m³ in the policemen and from 4.89 ng/m³ to 120.61 ng/m³ in the controls. PAHs possessed cytogenetic effects in highly exposed persons. The registered adverse effects increase the health risk for people professionally exposed to PAHs.

Key Words: chromosome aberrations, PAH-exposure, traffic policemen

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