

DNA DAMAGE AND DECREASE OF SPERM QUALITY IN MEN OCUPATIONALLY EXPOSED TO POLYCYCLIC AROMATIC HYDROCARBONS (PAH's)

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Background and aims: Over the last decade, concerns have been mounting over declining levels of semen quality (1).

Polycyclic aromatic hydrocarbons (PAHs) constitute a group of genotoxic, lipophilic, and endocrine-disrupting chemicals that are distributed in the environment. The aim was to evaluate the association between the urinary levels of 1-hydroxypyrene with the DNA damage, with sperm quality and with the frequency of CYP1A1, GSST1 and GSTM1 polymorphisms.

Methods: A cross-sectional study was designed to evaluate the adverse effects of PHAs. A total of 71 subjects, 36 occupationally exposed and 35 unexposed men were included in our study. Semen, blood and urine samples were taken to volunteers to evaluate: sperm quality, 1-hydroxypyrene urinary levels (Biomarker of exposure PAH's), DNA damage and the frequency of polymorphism CYP1A1, GSTT1 y GSTM1.

Results: DNA damage was significantly higher in occupationally exposed subjects ($p < 0.05$). The frequency of genotypes of the enzymes tested was not statistically different between both groups. The sperm quality was significantly lower in the exposed group ($p < 0.05$). 1-hydroxypyrene urinary levels were higher in the exposed group ($p = 0.01$). Sperm/ml, total count of sperm and CYP1A1 (m4) polymorphism were negatively associated with 1-hydroxypyrene.

Conclusion: PAH exposure decreases sperm quality and induce DNA damage.

References:

(1) Ping-Chi Hsu, I-Yueh Chen, Chih-Hong Pan, Kuen-Yuh Wu. Sperm DNA damage correlates with polycyclic aromatic hydrocarbons biomarker in coke-oven workers. *IntArchOccupEnvironHealth* (2006) 79: 349–356