

Valutazione dell'esposizione ad idrocarburi policiclici aromatici ed a benzene, toluene e xileni di lavoratori di una centrale termoelettrica che utilizza olio combustibile denso

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KEY WORDS

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SUMMARY

«Evaluation of the exposure to polycyclic aromatic hydrocarbons, benzene, toluene and xlenes in workers of a power plant fuelled with heavy oil». Occupational exposure to polycyclic aromatic hydrocarbons (PAHs) has been demonstrated in many industrial sectors. However, up to date there are few studies in the literature on PAH exposure in thermoelectric power plants. The study was aimed at the evaluation of personal exposure to PAHs in workers of a power plant fuelled with heavy oil. Exposure to polycyclic aromatic hydrocarbons (PAHs) and to benzene, toluene and xlenes (BTX) was evaluated on power plant workers exposed to heavy fuel oil; the control group consisted of office workers of the same power plant. Altogether 39 subjects were studied, for a total of 84 days of monitoring. Personal environmental exposure, cutaneous exposure and urinary concentrations of 1-hydroxypyrene (1-OHP), trans,trans-muconic acid (TTMA) and nicotine were measured. Personal environmental exposure to PAHs was very low; only maintenance workers showed exposure to total carcinogenic PAHs significantly higher than controls (median levels 3.05 and 0.88 ng/m³ respectively). All workers showed very low levels of dermal exposure to PAHs (less than 1 ng). The median 1-OHP urinary concentrations were 0.16, 0.11 and 0.08 μmol/mol creatinine in the groups of exposed workers and 0.08 μmol/mol creatinine in the control group. Neither the exposed workers nor the controls showed a significant increase in 1-OHP urinary concentrations across the shift. The regression analysis showed a significant effect of cigarette smoking on urinary 1-OHP, while no association was observed between occupational exposure and diet. Personal environmental exposure levels to BTX were very low. TTMA urinary concentrations of the exposed subjects were similar to those of the controls. No significant increase in the TTMA urinary concentrations was observed across the shift and, as expected, smokers showed higher values than non-smokers. The study did not show a measurable intake of PAHs and BTX in power plant workers that could be ascribed to occupational exposure, thus confirming the efficacy of the protective measures in force.

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