

Occupational Exposure to Polycyclic Aromatic Hydrocarbons (Pha) among Asphalt and Road Paving Workers

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Abstract : Aims: To assess the current exposure to the PHA among various workers in the sector of asphalt and road paving. Methods: The assessment of the exposure to PHA has been performed on workers (n=14) belonging to two companies, allocated into several activities such as road paving, manufacturing of coated bituminous warm, manufacturing of asphalt cut-back, manufacturing of emulsion of asphalt. A group of control subjects (n=18) was associated. The internal exposure to PHA was investigated by measurement of the urinary excretion of 2-naphtol, urine metabolite of naphtalene, one of the biomarkers of total PHA exposure. Urine samples were collected from the exposed workers, at the beginning of the week, at the beginning of the work shift (BWBS) and at the end of the work shift, at the end of the week (ESEW). In the control subjects, single samples of urine were collected after the end of the work shift. Every subject was invited to answer a questionnaire for the collection of technical and medical data as well as smoking habits and food intake. The concentration of 2-naphtol in the hydrolysate of urine was determined spectrophotometrically, after its reaction with the Fast Blue BB salt (diazotized 4-benzoylamino-2,5-diethoxyaniline). Results: For all the workers included in the study, the 2-urinary naphtol concentrations were higher than those in the control subjects (Median=9,55 µg/g creatinine) whether it is at (BWBS) (Md=16,2 µg/g creatinine) or at (ESEW) (n=18, Median=32,22 µg/g creatinine). Considerable differences are observed according to the category of job. The concentrations are also higher among smokers. Conclusion: The results show a significant exposure, mainly during manual laying, reveals an important risk particularly for the respiratory system. Considering the current criteria, carcinogenic risk due to the PHA seems not insignificant.

Keywords : PHA, asphalt, assessment, occupational, exposure

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