

HUMAN BIOMONITORING ON CO-EXPOSURE TO STYRENE AND XYLENE – ASSESSMENT OF GENOTOXIC EFFECTS

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Workplace environment represents the main source of exposure to organic solvents. These solvents are extensively used in chemical industry and particularly important to various chemical and technical processes. Co-exposure to styrene and xylene frequently occurs in numerous occupational settings. These substances are raw materials applied in processes during the manufacture of polymers, paints, pigments, and glues.

The aim of this study was to characterize possible genotoxic effects of exposure to a mixture of organic solvents – styrene and xylene, by the measurement of DNA damage by cytokinesis-blocked micronucleus (CBMN) assay and comet assay in workers from a chemical manufacturing polymers industry. Peripheral blood lymphocytes were obtained from venipuncture from 17 workers, who also completed a characterization survey, and compared with a control group without exposure (n=12). Alkaline comet assay was performed to assess DNA damage. Written consents from the participants involved in this study were obtained.

The results obtained verified that the workers had higher mean of the majority of genotoxicity biomarkers under study in comparison with controls, namely micronucleus (6.29 ± 5.67 vs 3.75 ± 4.39) and nuclear buds (1.82 ± 2.16 vs 0.00 ± 0.00), respectively. DNA damage mean measured by comet assay was also higher in the workers group in comparison with controls (23.83 ± 19.58 vs 7.46 ± 5.33). Only nucleoplasmic bridges showed a lower mean in the workers (6.29 ± 0.87 vs 3.75 ± 1.33).

In conclusion, our results suggest that this co-exposure in this occupational context induce DNA damage in peripheral blood lymphocytes. Refined studies should be developed to better understand the type of interaction that take place to explain these effects.