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Gene polymorphisms of the phase II detoxification enzymes and genotoxicity in shoe manufacturing personnel

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People employed in the shoe manufacture and repair industries are at an increased risk for cancer. These people are routinely exposed to complex mixtures of solvents diluents in glues, primers and degreasers. The aim of this study was to determine the genotoxic effects in a group of footwear-workers occupationally exposed to solvent-based adhesive and solutions containing organic solvents, mainly toluene. Cytogenetic analysis in peripheral blood lymphocytes was used to compare 90 shoe workers and 131 control subjects. Frequencies of damaged cells, chromosomal aberrations, including breaks and rearrangements were scored for both groups. Polymorphisms in genes GSTT1, GSTM1, and GSTP1, determined by PCR-based methods, were used as biomarkers of susceptibility. The exposed group showed a significant increase of total chromosomal aberrations (CAs) in comparison to control ($2.65 \pm 0.24\%$ and $1.54 \pm 0.12\%$, respectively). The frequency of chromosome-type aberrations (CSA) was 3.9 time higher ($P=0.001$) in the exposed than in the control group ($2.07 \pm 0.19\%$ and $1.52 \pm 0.12\%$, respectively). The frequency of chromatid-type aberrations (CTA) was significantly lower ($P=0.05$) in exposed group than in control ($0.58 \pm 0.2\%$ and $1.02 \pm 0.11\%$, respectively). GSTT1 null subjects exhibited significantly higher ($P=0.05$) frequency of CSAs than GSTT1 positive subjects ($2.00 \pm 0.43\%$ and $1.40 \pm 0.25\%$). Different genotype of GSTM1 and GSTP1 did not show any influence on frequency of evaluated parameters.

Biography

Tatiana Matakova has completed her PhD from Comenius University in Bratislava in the field of Medical Biochemistry. She is the Head of Department of Molecular Analysis in the Division of Molecular Medicine, Martin Biomedical Center. Her research is focused on developing new markers for early cancer detection. She has published 2 university textbooks and 45 scientific papers in reputed journals.

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