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Hungarian nurse study for occupational cancer risk assessment using Geno-Toxicological Methodology

Health professionals chronically exposed to cytostatic drugs, formaldehyde and anesthetic gases in hospitals are at higher risk of lung diseases, hematological, immunological and reproductive alterations. Without safety devices, cytostatic and anesthetic gas exposure often exceeds the safety limits, especially when no proper ventilation has been installed in operating theaters. In the present study we assessed the health risk among exposed nurses and measured geno-toxicological parameters in the presence or absence of confounding factors such as smoking. The investigations were carried out in 800 subjects, exposed to different hazards using in health services. The data were compared to healthy, non-exposed controls. The measured biomarkers were clinical laboratory routine tests, completed with geno-toxicological (Chromosome Aberrations (CA) and Sister-Chromatid Exchange (SCE), DNA repair) and immunotoxicity. The exposed groups were divided into three main groups exposed to cytostatic drugs, anesthetic gases and formaldehyde. In the groups of health personnel exposed to cytostatic and formaldehyde was carried out elevated chromosomal aberrations and depressed DNA-repair. Although those nurses who were exposed to anesthetic gases, we did not find significant changes in the frequency of chromosome aberrations. Sister-chromatid exchange rate in anesthetic gas exposed smokers, was increased, when it was compared

to nonsmokers. We also found increases of apoptosis and inhibition of UV induced DNA repair capacity. Clinically these exposed individuals had high incidences of anemia, elevated serum glucose levels, thyroid dysfunction and benign tumors compared to controls. Low level of cytogenetic changes may relate to the increased apoptotic rate of peripheral blood lymphocytes and depressed DNA-repair capacity due to the low risk of misrepair. Our results suggest that biomarkers can be useful in tracking occupational/environmental genotoxic effects among exposed health personnel.

Speaker Biography

Anna Tompa was graduated in medicine in Budapest Semmelweis Medical University and became an Assistant Professor at the Institute of Pathology and Cancer Research of the School of Medicine. After specialized in pathology she went to the United States to study the advanced methodology of experimental cancer research. She has continued her research activities focused on the cancer prevention and obtained her D.Sc. in 1999 from Hungarian Academy of Sciences. She has written more, than 160 publications and given about 200 scientific lectures in different domestic and international congresses. She is a member of numerous domestic and international scientific societies, and presently she is emeritus fellow of Ramazzini Collegium and OECD expert in chemical safety. Today, She is an emeritus professor and vice director of Public Health Institute in the Semmelweis University, Budapest, Hungary.

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