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ABSTRACT BOOK

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W. Ricciardi, S. Marcheggiani, C. Puccinelli,
M. Carere, T. Sofia, F. Giuliano, E. Dogliotti and L. Mancini

A POSSIBLE RELATIONSHIP BETWEEN AIR POLLUTION AND INCREASED BASELINE FREQUENCY OF MICRONUCLEI IN SUBJECTS LIVING IN TURIN (NORTH-ITALY)

Alfredo Santovito, Claudio Gendusa, Piero Cervella
Department of Life Sciences and Systems Biology University of Turin, Turin, Italy

Background. Epidemiologic studies have shown a correlation between chronic exposure to moderate or high pollution levels and increased risk of cancer, especially lung cancer. The urban population can be exposed to a variety of environmental pollutants that include different chemical and physical agents, all of which can influence the genomic instability. In this scenario, biomarker-based population studies may serve as complementary tools providing a better understanding of the relative contribution of ambient atmospheric pollution to the overall genotoxic burden suffered by city dwellers.

Aims. We used the Micronuclei (MNi) assay to evaluate the baseline genome damage in binucleated peripheral blood lymphocytes selected from subjects belonging to the general population of Turin.

Study Area. Turin, North-Western Italy, is located in the Po river valley, an area where air exchanges are limited by the surrounding mountains, dominant winds are weak, and air pollutants can accumulate easily. For these reasons Turin is one of the most polluted European cities in terms of Particulate Matter (PM) and ozone.

Methods: The study population included 150 blood donors randomly sampled. Selected individuals were subjects without any known exposure to specific xenobiotics, except those of the routine household and traffic. MNi, Nucleopalsmic Bridges (NPBs), Nuclear Buds (NBUDs) and Cytokinesis-Block Proliferation Index (CBPI) were scored in 2000 binucleated lymphocytes per subject. The frequency of MNi has been associated with age and sex in order to investigate the possible correlation between this cytogenetic marker and the above mentioned factors.

Results. The MNi, NPBs, NBUDs and CBPI average frequencies were 7.987±5.177, 5.427±2.510, 5.533±3.125, and 1.663±0.125 respectively, whereas the average of MNi, NPBs and NBUDs per cell (%) were 0.399±0.259, 0.271±0.125, 0.227±0.156, respectively. A significant correlation was found between the frequency of MNi and age ($P<0.001$), whereas the sex do not seem to influence the level of the genomic damage.

Discussion. The frequency of MNi observed in our sample was one of the highest reported in literature among European populations, indicating that some local environmental factors may be involved in determining the high frequency of the observed cytogenetic damage. Turin is a city with a high traffic density and consequent high levels of atmospheric genotoxic substances, such as PM_{10}, benzene, toluene, and xylene. Moreover a large automotive industrial complex is located in the inner suburbs of the city, as well as other smaller industrial installations that, with their discharge products, considerably contribute to air pollution.