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PRINT: ISSN 0972-3757 ONLINE: 2456-6360

Int J Hum Genet, 5(1): 45-48 (2005)
DOI: 10.31901/24566330.2005/05.01.07

Micronucleus Frequencies and Nuclear Anomalies in Exfoliated Buccal Epithelial Cells of Firefighters

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KEYWORDS Buccal epithelium; firefighter; micronucleus assay

ABSTRACT To determine the genotoxic effects of combustion fumes on the target tissues, micronucleus (MN) assay was carried out in exfoliated buccal epithelial cells of 47 firefighters. Compared to a mean value of 1.25 MN per 1000 cells in 40 matched controls, the firefighters had 3.91 MN per 1000 epithelial cells in their oral cavity, thereby showing 3-fold rise over control. Besides MN, the firefighters exhibited higher prevalence for several other nuclear anomalies like 'broken egg' nuclei (5.69 vs. 1.73/1000 cells), pyknotic and condensed nuclei (2.86 vs. 0.62/1000 cells), karyorrhexis (24.12 vs. 6.45/1000 cells), and karyolysis (152.6 vs. 21.5/1000 cells). All these changes were statistically significant ($p < 0.05$). The nuclear changes were more prevalent in firefighters with relatively longer duration of service. MN and other nuclear anomalies reflect genetic changes, events associated with carcinogenesis. Therefore the results unveil a high risk of developing cancer among firefighters.

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