BIOMONITORING GENOTOXICITY IN THERMOELECTRIC POWER PLANT WORKERS EXPOSED TO VOLATILE ORGANIC COMPOUNDS OF FUEL-OIL

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On a daily basis, several occupational groups may be highly exposed to petroleum derivatives, which are potentially genotoxic. In thermoelectric power plants, workers are exposed to volatile organic compounds (VOCs) released during the combustion of fuel used to run the turbine-generators. The present study was designed to examine the genotoxic effects of occupational exposure to VOCs in workers from a thermoelectric power plant, using the micronucleus assay with exfoliated buccal epithelial cells. A total of 44 exposed workers and 47 non-exposed individuals were recruited. The former group was mainly exposed during the transportation of fuel oil and naphtha and the maintenance of turbines and engines. For each individual, 1000 buccal epithelial cells, stained according to the Feulgen method, were analyzed for the frequency of micronucleated cells and cells with other nuclear anomalies (pyknosis, karyorrhexis, and karyolysis). Information on life-style factors and an informed consent were obtained from each participant. Significant differences ($p<0.001$) in the median frequencies of micronucleated cells (1.8 vs. 0.2) and cells with other nuclear anomalies (82.4 vs. 58.3) were observed between VOC-exposed and non-exposed individuals. The analyzed confounding factors (age, smoking, alcohol, and mouthwash) did not show any significant association with the frequency of micronucleated cells, while age was found significantly associated with the frequency of cells with other nuclear anomalies. To our knowledge, this is the first report linking VOCs' exposure to potential genotoxic effects in buccal epithelial cells of thermoelectric power plant workers.

Keywords: micronuclei, volatile organic compounds (VOCs), occupational health