

ORGANIC DUST EXPOSURE IN BAKERIES - ASSESSMENT OF GENOTOXIC EFFECTS

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Exposure to organic dust occurs in a range of occupational settings including food industries, such as bakeries and pastry industries. Organic dust consists of particulate matter of microbial, plant or animal origin. Its specific composition depends of the type of setting but can implicate several agents such as viruses, bacteria and Gram-negative bacteria endotoxins, actinomycete, spores from moss, fern or fungi, fungi mycotoxins and glucans, algae or plant cell, enzymes and proteins of plant or animal origin, antibiotics and other products from biotechnological processes, insects and mites (and their fragments and excreta). In bakeries the flour dust is the main responsible for the organic dust exposure. Flour is a complex organic dust consisting of one or a mixture of several cereal grains (wheat, rye, millet, barley, oats or corn cereal) that have been processed or ground by milling. Moreover, flour may contain a diverse number of contaminants, such as silica, fungi and their metabolites (mycotoxins), bacterial endotoxins, insects, mites, mammalian debris and chemical additives such as pesticides and herbicides. Several studies have already reported respiratory health effects in exposed workers, both in small- and large-scale industries, related to the distinct types of dust generated during the production process. Respiratory system symptoms and diseases induced by occupational dust are influenced by the type of dust, dose, duration of exposure and genetic factors. The aim of this study was to characterize possible genotoxic effects of particulate matter by the measurement of DNA damage by alkaline comet assay in workers from bakeries. Peripheral blood lymphocytes were obtained from venipuncture from 35 workers, who also completed a characterization survey, and compared with a control group without exposure (n=43). Alkaline comet assay was the technique selected to assess genotoxic effects. The results achieved verified that the exposed group had higher DNA damage mean in comparison with controls (13.95 ± 11.78 vs 12.00 ± 8.54), translated in the % tail intensity. Until now, no relationship was observed between organic dust exposure of bakers and DNA damage, however it is interesting to verify a potential increase in DNA damage regarding to this exposure, even without statistical significance. In conclusion, our results suggest that organic dust in this occupational context induced a slightly DNA damage in peripheral blood lymphocytes. Additional studies should be developed to support these findings.

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