

TOBACCO SMOKE OCCUPATIONAL EXPOSURE: BIOMARKERS OF BIOLOGICAL DAMAGE

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Introduction

High concentration of toxic substances emanated from tobacco smoke in entertainment places such as restaurants, bars and nightclubs may compromise indoor air quality (IAQ) generating environments of likelihood health risk. Their employees, particularly those exposed to second-hand smoke, are at increased risk for developing chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD), asthma and lung cancer.

Objectives

In this work, we aimed at evaluating relationships between occupational ETS exposure, biological damage (DNA or proteome alterations) and putative respiratory dysfunctions.

Materials and Methods

A group of restaurants located in Lisbon has been studied, in which fine particles (smaller than 2.5µm; PM_{2.5}), indicative of environmental tobacco smoke (ETS) contamination, were measured. After informed consent, workers were evaluated for acute exposure to ETS based on cotinine levels in urine and clinically evaluated for their respiratory health by spirometry measurements and chestpiece auscultation. Effects of ETS exposure on genotoxic lesions were evaluated by measuring DNA/chromosomes breaks in peripheral blood lymphocytes and buccal mucosa cells. Effects of ETS exposure on plasma proteins is being studied using a 2D-DIGE-MALDI-TOF/TOF approach. To achieve that goal, global proteome characterization is being carried based on the same individual plasma samples collected for genotoxic studies and were pooled according to previous criteria.

Results

Results have confirmed higher respirable particle levels in smoking-designated areas of those entertainment places, indicating an ETS contamination. Leukocytes from ETS-exposed-workers presented lower levels of genotoxic-induced damage in comparison with non-exposed workers, suggesting an ETS-induced stress adaption response in exposed-workers. By proteomics, we are now to investigating those workers for putative alterations on their plasma proteome to provide additional insights on the adaptative response mechanisms that might be activated by ETS exposition.

Conclusion

Altogether, this study provides information on indoor air quality of Lisbon smoking entertainment places, in particular ETS contamination, and may provide biomarker candidates for occupational ETS-exposure which might precede respiratory diseases on their employees.

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