

INFLUENCE OF TRAFFIC-RELATED AIR POLLUTION ON BIOMARKERS OF OXIDATIVE STRESS AND INFLAMMATION IN HEALTHY ADULTS: SEASONAL FOLLOW-UP

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Background and Aims: Traffic-related air pollution is known to induce oxidative stress and inflammation in humans. Our aim was to assess whether measurement of oxidative stress and inflammation markers are associated with exposure parameters.

Methods: The study population consisted of 48 healthy non-smoking adults. Following biomarkers for oxidative stress and inflammation were analysed in both Winter and Summer season: oxidative DNA damage in blood (comet assay, FPG sites), 15-F2T-isoprostane in plasma, 8-oxo-2'-deoxyguanosine (8-oxodG) in urine, and nitric oxide (eNO) in exhaled breath.

Exposure to traffic-related air pollution during the 2 seasons was assessed: NO₂, PM₁₀ and O₃ concentrations at the home address (4x4 km grids) were calculated by interpolation of measured concentrations at stationary stations. A Geographical Information System (GIS) was used to calculate traffic-related parameters. Also, participants wore a personal dosimeter for NO₂.

Associations between exposure parameters (single pollutant/exposure model) and biomarkers, within each individual in Winter and Summer, were tested using multiple mixed-effects regression models.

Results: NO₂ and PM₁₀ concentrations correlated positively with eNO (p<0.10 and <0.01, respectively). For ozone, positive associations were found with comet assay results, 15-F2T-isoprostane measurements, and 8-oxodG in urine (p<0.05, <0.10 and <0.10, respectively). No correlations with GIS data or personal NO₂ dosimetry were observed.

Further, multi-pollutant models will be analysed. Results will be presented at the ISEE meeting.

Conclusions: It is well known that traffic-related air pollution triggers inflammation and oxidative stress reactions in individuals with chronic diseases, such as cardiovascular patients, asthmatics and diabetics. In our study biomarkers measured in healthy adults correlated with background outdoor pollutants at home address.

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