# DIFFERENT PATTERNS IN CHANGES OF EXHALED BREATH CONDENSATE PH AND EXHALED NITRIC OXIDE AFTER OZONE EXPOSURE

F. Hoffmeyer, K. Sucker, C. Monsé, H. Berresheim, B. Jettkant, N. Rosenkranz, T. Brüning, J. Bünger

Institute for Prevention and Occupational Medicine of the German Social Accident Insurance, Institute of the Ruhr-Universität Bochum (IPA), Bürkle-de-la-Camp-Platz 1, 4789 Bochum, Germany, hoffmeyer@ipa-dguv.de

Introduction:

Study objective was the evaluation of pH in exhaled breath condensate (EBC-pH) and nitric oxide in exhaled breath (FeNO) as biomarkers of ozone induced inflammation. We recently demonstrated that an ozone exposure of 240 ppb is sufficient to reduce lung function indices.

Methods:

We enrolled 10 healthy subjects exposed in an intermittent exercise protocol to ozone concentrations of 240 ppb and 40 ppb (sham exposure). The biomarkers EBC-pH and FeNO were assessed before, immediately post ($_{post}$) and 16 h after exposure ($_{16h}$).

Results:

Compared to baseline, EBC-pH was significantly higher immediately after sham and ozone exposures but not 16 h later. There was a tendency for a negative net change in EBC-pH when the differences after ozone exposure were adjusted for those after sham exposure ($\Delta pH_{post}$ -0.38%, $\Delta pH_{16h}$ -0.23%). Concerning FeNO, we observed no changes of values after sham exposure compared to baseline but measured a significant lower net response at the end of exposure ($\Delta FeNO_{post}$ -17.5%) which was transient within 16 h ($\Delta FeNO_{16h}$ -9.4%).

Conclusions:

Measured levels of biomarkers integrate processes of its production and scavenge. Exercise known to enhance EBC-pH may compensate for EBC acidification associated with inflammation resulting in diminished change of this biomarker. Ozone imposes an oxidative burden and reactions between reactive oxygen species and NO might be an explanation for reduced FeNO levels.