

COMPARISON OF DIFFERENT NON-INVASIVE METHODS FOR THE DETECTION OF ALLERGIC ASTHMA

**M. Raulf-Heimsoth, V. van Kampen, E. Heinze, S. Bernard, G. Borowitzki, S. Freundt,
K. Sucker, C. Eliakopoulos, T. Brüning, R. Merget**

Institute for Prevention and Occupational Medicine of the German Social Accident Insurance
(IPA), Ruhr-Universität Bochum, Germany

Background: Most widely used non-invasive methods to assess the lower airways are induced sputum (IS), fractional exhaled nitric oxide (FeNO) and exhaled breath condensate (EBC). In addition, collection and analysis of nasal lavage fluid (NALF) provide information on different aspects of inflammatory processes in the upper airways. Here we focused on the assessment of airway inflammation with a panel of non-invasive methods in health care workers with and without current allergic respiratory symptoms ten years after the latex ban in German health care facilities. **Methods:** 91 HCWs (92% females; age: 43.6 years; 15% current smokers) were examined in our institute. This included physical examination, lung function test, skin prick test (SPT) to latex as well as measurement of specific IgE (sIgE) to latex and ubiquitous environmental allergens (sx1), bronchial hyperresponsiveness, exhaled nitric oxide (FeNO), the collection and analysis of IS, NALF and EBC. **Results:** Current sensitization to latex (positive SPT or sIgE to latex) was detected in 61 subjects (67%), and 60 subjects (66%) were atopic (positive sIgE to sx1). FeNO was significantly correlated with the atopy status (quantified via sIgE to ubiquitous environmental allergens) ($r=0.438$; $p<0.0001$). 29 of the non-smoking subjects (38%) reported ongoing asthmatic symptoms (AS) and 21 of them reported also rhinitis. In subjects with AS the EBC concentrations of nitrogen oxides (NO_x; $p=0.027$) and leukotriene B₄ ($p=0.025$) were significantly higher than in subjects without AS, whereas the EBC pH values were not different. In addition, in the subjects with AS the numbers of eosinophils ($p=0.0115$) and the concentrations of IL-5 ($p=0.017$) in IS samples were significantly higher than in subjects without AS. No significant differences between groups were detected for FeNO values and for soluble and cellular biomarker concentrations in NALF. In NALF as well as in IS samples, there were good correlations between eosinophilic cationic protein (ECP), IL-5 and eosinophils in the same material. **Conclusion:** Non-invasive inflammatory monitoring using FeNO, collection and analysis of EBC, NALF and IS may assist in the diagnosis of respiratory diseases. Especially the self-reported current asthmatic symptoms were reflected by eosinophilic inflammation including cell and mediator profile in IS.