

IMPLEMENTATION OF NON-INVASIVE METHODS IN THE DIAGNOSIS OF DIISOCYANATE-INDUCED ASTHMA

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Background: Although diisocyanate-induced asthma is characterized by airway inflammation, its diagnosis is difficult because the immunopathological mechanism of the disease and the determinants of exposure are not well defined. It was the aim of this study to evaluate non-invasive methods like nasal lavage fluid (NALF) and induced sputum to advance the knowledge of diisocyanate-induced asthma and to enhance the diagnostic efficiency. **Methods:** Sixty diisocyanate-exposed workers with work-related shortness of breath underwent a standardized 4-steps-one day-whole body exposure test with diisocyanates used at work up to 30 ppb. NALF and sputum were collected before, 0.5 h and 24 h after the end of exposure. The samples were studied with regard to cellular composition and soluble inflammatory biomarkers. In addition, ten controls with bronchial hyperresponsiveness, but without any prior occupational diisocyanate exposure were examined in the same way. **Results:** Eleven of the 60 subjects showed a significant asthmatic reaction (pulmonary responders) after the challenge (FEV1-decrease > 20%). NALF samples did not show significant effects neither on the cellular composition nor on mediator concentrations in any group at any time point. In contrast, the percentages of eosinophils as well as ECP- and IL-5-concentrations in the sputum of the pulmonary responders were increased 0.5 h and/or 24 h after challenge. No similar effects were detected in sputum samples of the non-responders or of the control subjects. The most sensitive sputum parameter was the increase of percentage of eosinophils after challenge (elevated in 83.3% of responders). **Conclusion:** Positive asthmatic reactions to diisocyanates are accompanied by an influx of eosinophils in the lower airways. Therefore in the diagnostic procedure of diisocyanate-related airway diseases the analysis of induced sputum should be implemented