International Conference 'Advances in Pneumology'
Bonn, 17-18 June 2011

ALLERGIC OCCUPATIONAL NON-IMMEDIATE TYPE ASTHMA DUE TO AMMONIUM PERSULFATE

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Introduction: An increasing number of published studies over the last decade have associated exposure to persulfates with the development of asthma and dermatitis. The development of immediate-type occupational asthma due to persulfates, mostly ammonium persulfate (APS) with positive skin prick test reactions has been well documented especially among hairdressers who are exposed to APS-containing bleaching products. To our knowledge only two cases of non-immediate type reactions have been described in the literature. Case report: We report the case of an atopic worker who developed work-related asthmatic symptoms shortly after beginning his work in a persulfate production plant. The patient complained of asthmatic attacks, rhinitis and generalized skin rash with a clear temporal relation to his occupational exposure to bleaching powders. Symptoms were attributed to house dust mite allergy by his pneumologist, and endoscopic ethmoid surgery and specific immunotherapy with a house dust mite extract were performed without any positive effect. When his lung function deteriorated, he was removed from his workplace, but when he returned to work there was a relapse of his symptoms parallel to a significant decrease in serial peak expiratory flow during working periods. The patient was admitted to our institute for a medical opinion. The patient underwent a comprehensive diagnostic examination including spirometry, bodyplethysmography, methacholine testing and specific testing with APS (skin prick test (SPT), patch test and inhalative challenge). APS was bought from Sigma-Aldrich (Deisenhofen, Germany). SPT with APS was performed with a freshly prepared 10% (w/v) solution, and patch testing with the APS preparation from Hermal (Reinbek, Germany). The inhalative challenge with APS was done with a 646-DeVilbiss nebulizer and an APSpro dosimeter (Jäger, Würzburg, Germany) with freshly prepared APS in quadrupling doses from 0.4 mg to 0.45 mg. The response was evaluated by spirometry, bodyplethysmography, exhaled nitric oxide (eNO), serial methacholine testing and eosinophil counts in induced sputum. The general medical examination showed no pathological findings, but sensitization to house dust mites was shown by SPT and specific IgE (CAP class 2, Phadia, Uppsala, Sweden). Asthma was corroborated by a positive response to methacholine testing after a dose of 215 ?g. While SPT with APS was negative, patch testing showed a crescendo reaction with a peak at 48h. After inhalation of APS no significant immediate airway reaction was recorded after the latest dose (cumulative 0.6 mg), but the patient developed an isolated late symptomatic airway obstruction 4 to 6 hours afterwards. This was accompanied by an increase of eNO from 21 ppb to 57 ppb and an increase of eosinophils in induced sputum from 5,0% to 12,5% after 24 h (total cell numbers 37 x 10^5 and 50 x 10^5, respectively). Serial methacholine testing did not show increased hyperresponiveness after specific testing.

Conclusions: Isolated late asthmatic reactions due to persulfates with negative SPT reactions but positive patch testing may occur in subjects with asthma and occupational exposure to these low molecular weight compounds. Both skin sensitization and eosinophilic inflammation clearly indicate an underlying immunologic mechanism.