Specific antibodies to glutaraldehyde (GA) and formaldehyde (F) among medical radiation technologists (MRTs)

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Background: MRTs are exposed to sensitizers and irritants including GA and F. They may develop occupational asthma (OA) and work-related (WR) respiratory symptoms but the mechanism is not established.

Methods: As part of a survey of respiratory problems in this profession, we investigated the prevalence of serum specific IgE and IgG antibody to GA-HSA and F-HSA conjugates by ELISA among 15 asymptomatic MRTs and 22 MRTs with possible OA, who had reported WR respiratory symptoms (based on venables, 1993). Of these, 12 had asthma (methacholine PC_{20} < 8 mg/ml) and 10 had WR-symptoms but no asthma. All but one were female, and all were nonsmokers. A positive antibody level was defined as absorbance > mean + 3 sd among 8 unexposed lab controls. Exposure challenge to GA with analyses of induced sputum was conducted in 2 MRTs with WR-changes in PC_{20}.

Results: The prevalence of positive specific IgE to GA-HSA increased from 1 (6.7%) among asymptomatic MRTs to 2 (20%) of those with symptoms but no asthma, to 4 (33%) of the asthmatics. Serum specific GA-HSA-IgG was observed in only 1 subject in each group; none had positive IgE or IgG antibody to F-HSA. Exposure challenge with GA (0.1 mg/M^3) did not result in changes in spirometry or PC_{20}; the first MRT who had a post-challenge increase in eosinophils in induced sputum from 0.25% to 3.25% was IgE positve, consistent with GA-induced eosinophilic bronchitis, while the other (0% eosinophils before and after challenge), was IgE negative.

Conclusions: The increase in prevalence of GA-HSA IgE among those with asthma suggests that IgE-mediated responses may play a role in GA-related respiratory disease.

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