

LETTERS TO THE EDITOR

Associations between Contact Allergy to Epoxy Resin and Fragrance Mix

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Sir,

A Danish industry producing rotor blades for wind turbines with an epoxy-based technology had experienced an increased number of workers with dermatitis. To estimate the frequencies of work-related dermatitis, 603 workers were interviewed and clinically examined and 325 (82% men and 18% women) with suspected work-related dermatitis were patch-tested (to be published). As part of the results of the investigation, an association was found between contact allergy to epoxy resin and fragrance mix in the European standard series (odds ratio 5.5, 95% confidence interval (CI) 1.5–17; $p=0.009$, Table I). No obvious gender differences were discerned, but the number of female workers was limited. To investigate whether the association between these allergens was restricted to the workers or indicated a possible, general phenomenon, the patch-test population of our department was analysed with respect to the corresponding association.

RESULTS

Among 4857 consecutively patch-tested patients (39% men and 61% women) with dermatitis 1995–2002, simultaneous contact allergies to epoxy resin and fragrance mix were found in 11 patients (Table I). The odds ratio for simultaneous contact allergies among the patients was 2.8 (95% CI 1.3–5.4; $p=0.009$ exact method provided by Stat Xact-5, Cytel Software Corp). Among our patients, the association between contact allergy to epoxy resin and fragrance mix was restricted to men. The odds

ratio among the men was 6.2 (95% CI, 2.3–15; $p<0.001$), while among women it was 1.1 (95% CI 0.22–3.7; $p>0.3$). When testing the homogeneity of the odds ratios, the difference between men and women was statistically significant ($p=0.02$, Zelen's test).

DISCUSSION

Studies of statistical associations between allergens in the standard series have been reported previously (1–3). Epoxy resin has recently been reported to be associated with 9 allergens within the standard test series, but an association with fragrance mix was not reported (3). To the best of our knowledge, gender differences concerning associations between contact allergy to epoxy resin and fragrance mix have not been published previously.

Although exposure differences can be anticipated between populations in different countries as well as between the workers exposed to epoxy resin and the dermatitis patients in our department, the association between epoxy resin and fragrance mix was present in both populations. Gender differences concerning frequencies of contact allergies to fragrance mix and epoxy resin, respectively, are well known and are most probably explained by exposure differences (4–6).

Exposure-related statistical associations between contact allergies can be due to concomitant or simultaneous sensitizations, i.e. the allergens in question are present in the same product or in products that are often used in relation to one another (7). With regard to occupational exposure, gender differences concerning

Table I. Contact allergy to epoxy resin and fragrance mix among 325 patch-tested workers in an epoxy-based industry and in 4857 consecutively patch-tested dermatitis patients 1995–2002

	Men		Women		Total	
	n (%)	OR (95% CI) ^a	n (%)	OR (95% CI) ^a	n (%)	OR (95% CI) ^a
Investigated workers	267 (100)	–	58 (100)	–	325 (100)	–
Epoxy resin	30 (11)	–	4 (7)	–	34 (10)	–
Fragrance mix	12 (4)	–	5 (9)	–	17 (5)	–
Simultaneous	5 (2)	6.6 (1.5–26)	1 (2)	4.2 (0.06–67)	6 (2)	5.5 (1.5–17)
Investigated dermatitis patients	1914 (100)	–	2943 (100)	–	4857 (100)	–
Epoxy resin	32 (2)	–	34 (1)	–	66 (1)	–
Fragrance mix	104 (5)	–	229 (8)	–	333 (7)	–
Simultaneous	8 (0.4)	6.2 (2.3–15)	3 (0.1)	1.1 (0.22–3.7)	11 (0.2)	2.8 (1.3–5.4)

^aOdds ratio (95% confidence interval) contrasting the odds of contact allergy to fragrance mix among subjects with and without contact allergy to epoxy resin.

epoxy resin products were probably not present among the investigated workers. Components of the fragrance mix and epoxy resin are presumably not present in the same products. Additionally, to explain the gender differences among the patients, men should use at least one such product more often than women, why simultaneous or concomitant sensitization seems unlikely. Cross-sensitization is a non-exposure-related statistical association. This is a possible explanation that needs further investigation of the separate components of the fragrance mix in relation to the main component in epoxy resin in the standard test series (diglycidyl ether of bisphenol A). In the present study, not all the investigated individuals with contact allergy to fragrance mix were patch-tested with the components of the mix, which possibly would have been suggestive for the further investigation of putative cross-reacting substances. The significance of the gender difference concerning simultaneous contact allergies to epoxy resin and fragrance mix within the patient group is unknown, but it may possibly depend on differences concerning contact allergies to the components of fragrance mix. Whether the primary sensitizer is epoxy resin or some component of the fragrance mix may also be of importance.

To confirm and elucidate the statistical associations between epoxy resin and fragrance mix found within these populations, investigations within other patch-test populations, as well as further patch-testing, are necessary.

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