Occurrence of allergens in hospital premises

THIS investigation assessed the occurrence of allergens from the house-dust mites *Dermatophagoides pteronyssinus* (Der p 1), *D. farinae* (Der f 1), and *D. microseras* (Der m), and from dogs (Can f 1) and cats (Fel d 1), in Viborg Hospital, Denmark, in relation to the risk to patients and staff. Few similar investigations of hospitals have been carried out, and these have dealt solely with house-dust-mite allergens (1, 2). In public places, cat and dog allergens are known to be particularly high in upholstered furniture (3). Sixty dust samples were collected in a standardized manner from waiting rooms, corridors, wards, duty rooms, and staff lounges with a Darenas D 2000 vacuum cleaner. A total of 180 mite-allergen, 60 dog-allergen, and 60 cat-allergen analyses were performed at ALK-Abelló by the ELISA technique.

Since it seems to be impossible to remove all allergens from upholstered furniture, it should be avoided in patient areas of hospitals.

The results showed that the concentration of Der p 1 was higher than that of Der f 1, which in turn was higher than that of Der m. Only in one dust sample was the total occurrence of mite allergens marginally above the sensitization threshold level (4) of 2000 ng mite allergens/g dust; in all other samples, the value was lower (Fig. 1). Presumably these low levels of mite allergens are derived from outside contamination (5).

For Fel d 1, there is no well-defined threshold level for sensitization or symptoms, but a value of 8000 ng Fel d 1 allergens/g dust has been proposed; none of the dust samples tested contained such a high concentration. A correspondingly low occurrence of Can f 1 allergens was found, although the threshold value for symptoms in this case is even more uncertain (6); one dust sample contained 8902 ng Can f 1 allergens/g dust, while the remainder exhibited lower concentrations. The latter allergens are introduced via patients and staff clothing (7).

Despite efficient cleaning and adequate ventilation, the allergen count reveals that it is impossible to remove all allergens from upholstered furniture, and the possibility that a few particularly sensitive patients may react even to very low levels of allergens below the accepted threshold values cannot be excluded. Although the low levels of allergens are not regarded as a problem, avoidance of upholstered furniture in wards and outpatient departments which receive allergic patients might be considered.

Key words: cat allergens; dog allergens; hospital premises; mite allergens.

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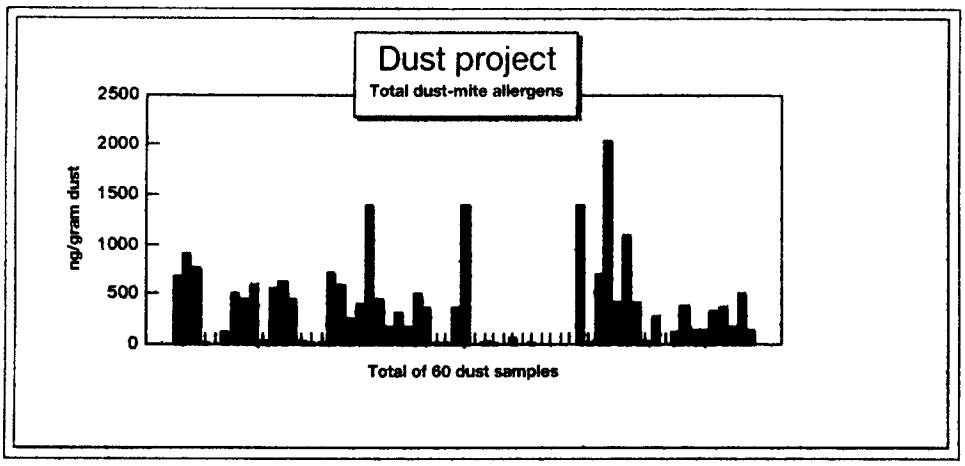

FIGURE 1 Concentrations of dust-mite allergens in hospital dust samples.

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Preoperative screening for general anesthesia

THE use of anesthetic agents and drugs during anesthesia induces a certain number of anaphylactoid reactions. The incidence of anaphylaxis to intravenous agents used during general anesthesia is about 1/5000 (1). Although systematic preoperative screening with general anesthetic drugs has been recommended by some authors (2, 3), this procedure is controversial (4, 5).

■ We investigated 1000 patients with a history of drug allergy or atopy prior to general anesthesia, using skin prick tests with muscle relaxants (MR), thiopental, latex, and benzodiazepines at the recommended concentrations (Table 1), to assess the validity of a systematic preoperative screening for these substances. Intradermal tests were also performed in patients who reported previous reactions during general anesthesia.

■ The mean age of the studied population was 55.6 years (SD: 16.2). Sixty percent were female. Fifteen percent of the patients were atopic (defined on clinical grounds). Drug allergy was reported by 77.6% of the patients. Previous general anesthesia was reported by 58.8% with a mean number of 1.7 (SD: 1.5), and 35 patients (0.035%) reported previous reactions during general anesthesia, but the agents used were unknown in 23 of them.

Skin tests with latex were positive in 8/1000 patients (0.8%): two nurses, two children with multiple surgery (one with spina bifida), three homemakers, and one male patient with occupational exposure to latex.

Table 1. Concentration used for prick and intradermal tests

		Prick tests	Intradermal tests (dilution factor)
Muscle relaxants	Suxamethonium	50 mg/ml	10^{-4} to 10^{-2}
	Pancuronium	2 mg/ml	10^{-4} to 10^{-1}
	Vecuronium	2 mg/ml	10^{-4} to 10^{-1}
	Atracurium	1 mg/ml	10^{-4} to 10^{-3}
	Thiopental	50 mg/ml	10^{-2}
	Diazepam	5 mg/ml	–
	Latex	10% w/v	–
Controls	Saline	0.9%	0.9%
	Histamine	10 mg/ml	0.1 mg/ml

Positive skin tests to MR were observed in six patients: in four cases, only to atracurium; in two cases, to both suxamethonium and atracurium. Four of them had previous reactions to general anesthesia; the two patients with latent sensitization to MR (no previous reactions to MR) had adverse reactions to cosmetics and eye-drops containing benzalkonium, respectively. In one patient with intraoperative anaphylaxis, sensitization to cephazolin was demonstrated.

The 11.4% (4/35) of the patients who reported previous reactions to general anesthesia showed positive results, whereas only 0.2% (2/965) of the patients without previous reactions presented positive results (Table 2).

Patients with positive skin tests to anesthetic agents or latex were advised to use alternative drugs or latex-free products, respectively. No allergic reactions were reported by avoiding these substances in further surgical procedures.

■ The prevalence of latex sensitization in this population was low (0.8%). However, preoperative screening for latex should be performed in patients with repeated exposure such as health-care workers, subjects with occupational exposure, and patients with myelodysplasia or multiple surgical procedures (6–8).

Our study in 1000 subjects suggests that preoperative skin tests with anesthetic drugs are useful in patients exposed to latex or with previous intraoperative reactions.

Since positive skin tests to MR were observed in six patients (in five cases to atracurium and in two cases to suxamethonium), and four of them had had previous reactions

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