

323.7 ± 66.1 and base substitution [TT] – IgE: 243.7 ± 62.2, $P > 0.05$), selected specific IgE levels, and skin test responses to aeroallergens (data not shown). The polymorphisms were strongly associated with one another.

TGF- β 1 is a cytokine that is constitutively expressed in the healthy airways but that also mediates a complex mix of pro- and anti-inflammatory activities. In contrast to some previous studies which found associations of polymorphisms in the TGF- β 1 gene with atopic diseases or related phenotypes (3, 6), we found no association of five selected polymorphisms in this gene with clinically manifested atopic asthma or other allergies. None of the polymorphisms were associated with total serum IgE, selected specific IgE, pulmonary function tests, and other phenotypic markers of atopic predisposition. Therefore, our results do not confirm previously published data on the association of the TGF- β 1 – 509 C/T polymorphism with increased serum total IgE levels (3). In conclusion, our results indicate that the mentioned polymorphisms of the TGF- β 1 gene do not influence susceptibility to atopic diseases and related phenotypes, at least in the Czech population.

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*Institute of Pathological Physiology
Medical Faculty, Masaryk University
Kom. namesti 2, Brno
Czech Republic
Tel. 420-5-42126548
Fax: 420-5-42126550
E-mail: dbuckova@med.muni.cz

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Environmental allergens in Kuwait

M. al Mousawi, N. Behbehani, N. Arifhodzic, H. Lovel, A. Woodcock, A. Custovic*

Key words: allergen; cat; cockroach; dog; exposure; mite; passive.

● THE level of exposure to indoor allergens outside the home has been investigated in many developed countries (1–3), but not in the developing ones. Allergic diseases were extremely rare in Kuwait until the mid-1950s (4). Since then,

however, the prevalence seems to have rapidly increased (e.g., within the 3-year period 1982–5, childhood asthma admissions had increased from 8.8% to 14.9% of emergency admissions [5]).

The prevalence rates of wheeze ever, current wheeze, and physician-diagnosed asthma in the ISAAC study in Kuwait were 25.9%, 16.1%, and 14.5%, respectively (6).

This study investigated the levels of mite, cat, dog, and cockroach allergen in public places in Kuwait. Dust samples ($n = 110$) were collected from 20 mosques, 10 restaurants, 15 nurseries, six family practices, five hospitals, 10 cinemas, and 12 schools. Der p 1, Der f 1, Fel d 1, Can f 1, and Bla g 2 were measured by mAb-based ELISAs.

Der f 1 was below the limits of detection in all the samples, and Der p 1 was detected in one sample only. Can f 1 was above the detection limit in 14 samples (eight mosques, four cinemas, and two restaurants) (Table 1). Bla g 2 was detected in 39 samples. However, Fel d 1 was detected in more than half of the samples (62 out of 110), and the highest levels were found in cinemas.

Fel d 1 in public places ($n = 110$; median 0.30 $\mu\text{g/g}$, range 0.06–1.62) was compared with the levels found in homes in the same area (15 homes with a cat [median 0.72 $\mu\text{g/g}$, range 0.10–700.0] and 274 homes without cats [median 0.18 $\mu\text{g/g}$, range 0.04–11.60]; Mann-Whitney U test). Fel d 1 from public places was significantly higher than in homes without cats ($P = 0.002$). However, levels in homes with cats were significantly higher than those found in public places ($P = 0.007$).

This is the first study to investigate the levels of indoor allergens in public places in the Middle East. In contrast to the

Cat allergen was found in more than 50% of public buildings.

Table 1. Fel d 1, Can f 1, and Bla g 2 levels in various public places in Kuwait

Public place	Fel d 1 Median (range)	Can f 1 Median (range)	Bla g 2 Median (range)
Mosques	0.26 (0.09–0.74)	0.12 (0.08–0.46)	0.35 (0.08–1.6)
Restaurants	0.25 (0.17–0.75)	N/A	0.41 (0.2–0.75)
Schools	0.12 (0.06–0.58)	N/A	0.14 (0.08–0.48)
Cinemas	0.47 (0.06–1.62)	0.07 (0.04–0.09)	0.37 (0.06–1.6)

majority of studies from developed countries (1–3), the levels of indoor allergens in public places in Kuwait appear to be low. For example, mite allergens were below the limit of detection in all but one of the samples. It is likely that low relative humidity is a major factor contributing to the low levels of mite allergen in Kuwait (the average day temperature is ~42°C, relative humidity is 15–30%, and annual rainfall is <15 cm).

Levels of cockroach allergen were relatively low, and comparable to those reported in public buildings in the UK (1). The concentration of Can f 1 was very low compared to other countries (1–3), probably because very few households keep dogs at home, as this is not a socially accepted practice.

In contrast to dog allergens, we detected cat allergen in more than half of the samples from public places. Although cat allergen levels in Kuwait appear to be lower in comparison with other countries where cat allergen in dust has been studied, passive exposure to Fel d 1 in public buildings may influence sensitization and symptoms. The highest level was

found in cinemas and was much higher than that in homes without cats. What may be of potential concern is the allergen found in carpets in mosques, where the individual breathing zone is in close proximity to the carpet during the prayer.

Indoor allergens may play a role in increasing asthma morbidity. It has recently been demonstrated that asthma severity in children with allergy to cat may be affected by indirect cat exposure at school (7). However, in Kuwait, we found comparatively low levels of indoor allergens in the dust collected from various places. There may be factors other than exposure and sensitization to indoor allergens that are important in increasing asthma morbidity in Kuwait.

*North West Lung Centre
Wythenshawe Hospital
Southmoor Road
Manchester M23 9LT
UK
Tel. +44 161 291 2494
Fax: +44 161-291 5057
E-mail: acustovic@fs1.with.man.ac.uk

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