

Atopy in a Pretoria asthma clinic

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Atopy in the Gauteng and Free State provinces of South Africa has been reported previously.¹⁻⁶ However, these studies reflect the allergy status of individuals living in Johannesburg and Bloemfontein. No study of this nature has ever been conducted in Pretoria. Pollen exposure is a well-recognised symptom trigger in allergic patients. In the former Transvaal (now Gauteng) pollen has been reported as present perennially, with grass pollen the most significant contributor in both absolute and relative terms. Furthermore, pollen and fungal counts frequently exceed levels of tolerance for allergy sufferers.⁷

Two previous studies were conducted to determine allergy sensitivity in Gauteng asthmatics.^{3,4} Moulds were the commonest allergens in Johannesburg,⁴ with skin prick test (SPT) positivity to a mixed mould panel occurring in more than 50% of patients tested. In a Soweto study conducted at Baragwanath Hospital³ mould sensitivity was much less common, with SPT positivity rates of 16.5% and 9.9% for *Aspergillus fumigatus* and *Candida albicans* respectively.

With regard to food sensitivities in Gauteng, apart from sensitivity to wheat, the prevalence of positive SPTs to food allergens was much lower than for the inhalant allergens in the Johannesburg study.⁴

Aim

The aim of this pilot study was to document allergy sensitivities of a group of asthmatic children attending an asthma clinic in Pretoria.

Methods

Standard allergen extracts (Alk Abelló) with negative and positive controls were used for testing. The allergen extracts used were Bermuda grass, five-grass mix, tree mix, dog hair dander, cat hair dander, standardised mite (*Dermatophagoides pteronyssinus*), *Blatana* sp. (cockroach), horse, cow's milk, hen's egg, wheat, fish mix, peanut, and potato. (A fresh potato was used in a prick-prick method.) Reactions were measured according to wheal size at 10 minutes, and wheal 3 mm greater than the negative control was regarded as a positive reaction for inhalants. The cut-points of Sporik were used for positive food reactions.⁸

Patients presenting to the paediatric asthma clinics at Pretoria Academic Hospital were approached for testing. The clinic is conducted twice a week and between 20 and 25 patients are seen per clinic. Every third patient seen between 30 October 2006 and 30 November 2006 was invited to participate in the study and enrolled if consent was received. Informed consent, according to the Ethics Committee Protocol of the University of Pretoria, was obtained from all parents and assent was obtained from children older than 7 years (protocol No. S131/2006). Associated atopic clinical symptoms (including allergic rhinitis and atopic eczema) were recorded for each patient. Each patient's condition was confirmed by the attending clinician and based on clinic records and diagnostic testing. All children had asthma defined by positive airway hyper-responsiveness. Skin prick testing was then conducted by the author.

Results

During the study period 186 patients came through the clinic; of every third patient invited to participate, a significant majority (50/62) gave consent. Of the children 28 had at least one positive SPT (56%). All patients were being treated for asthma and chronic rhinitis. Six of the 50 patients had eczema in addition to asthma.

The most common inhalant allergen to which the children were allergic was Bermuda grass (12/50, 27%). Few patients (5%) had a positive SPT to dog dander, and only 2% of patients had a positive SPT to cat dander. Surprisingly only 10% of patients showed sensitivity to house-dust mite (HDM). The rest of the inhalant allergens to which there were positive SPTs are shown in Table I.

The prevalence of positive SPTs to food allergens was much lower than for inhalant allergens (Table II). The most common food allergy was to potato (14% - 7 children, 2 of whom had eczema), and the second most common food allergy was to peanut. Only 1 child had a positive SPT to cow's milk and none of the children were positive for wheat.

Discussion

This study found that SPTs showed only 56% of asthmatic children in our Pretoria asthma clinic to be atopic. The quoted

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TABLE I. NUMBER OF POSITIVE SPTs IN THE 50 ASTHMATICS TESTED

Inhalants	N
Bermuda grass	12
Grass mix	9
Tree mix	4
Cat dander	1
Dog dander	2
HDM	5
Cockroach	8
Horse	2
Total	43

*Only 28 children had at least one positive SPT, and some children had more than one positive test.

TABLE II. NUMBER OF POSITIVE SPTs TO FOODS IN THE 50 ASTHMATICS TESTED

Food allergens	N
Cow's milk	1
Hen's egg	5
Wheat	0
Fish mix	3
Peanut	6
Potato	7
Total	22

*Only 11 children had at least one positive food SPT, and some had more than one positive test.

world-wide average for asthmatic children is 40 - 80%.⁹ Clearly SPT is only one method of determining atopy, and many authors now agree that atopy and asthma are independent diseases, sharing some common origins.¹⁰

The numbers of positive SPTs to dog and cat dander were small, but interestingly cat is usually suggested to be more important as an allergen than dog (P Potter - personal communication). This was not the case in our study. In two early studies, 9.5% of 789 patients in an early Transvaal report had SPTs positive for HDM,¹ and in a white private practice in Johannesburg, HDM accounted for the lowest proportion of positive tests of 8 aero-allergens tested (about 25%).² This evidence may suggest that in South Africa HDM occurs less commonly at altitude. However, a study of black asthmatic children from Soweto found 45% to be SPT positive to HDM.³ Subsequently Davis

*et al.*¹¹ reported that HDM antigen levels were detectable in 50% of the homes of the latter asthmatics.

Grass sensitivity reflects the prevailing aero-allergen exposure in a typical highveld city.⁷ The lower HDM sensitivity in Pretoria than Johannesburg may suggest that the climate in the former is adverse to mite growth. The latter requires more study and may also be a result of the small sample size in this study.

Potato is the most common food allergen in this study. Only a minority of the children with potato sensitivity had atopic eczema. Potato allergy has been linked to severe atopic eczema, but the prevalence is unknown.¹² There is no evidence for increased potato allergy in asthmatics. As in the Johannesburg study it is interesting to note that milk sensitivity occurred infrequently, even though it is the one food which parents implicate as being responsible for food-induced symptoms. Sensitivity to peanuts, eggs and fish was also infrequent.⁴ Overall food allergy is uncommon in asthmatics,¹³ and this is borne out in this study.

This small pilot study suggests that allergy may not only vary by population or country, but even among small communities with unique genetic and environmental exposures. Prospective documentation in all centres conducting allergy testing and the establishment of a national database could improve our understanding of allergy patterns and ultimately the management of our patients.

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