# Clinical characteristics of black asthmatic children

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**A prospective study of 455 black asthmatic children (277 boys) attending the Baragwanath Hospital asthma clinic was undertaken. A history was obtained by means of a standardised questionnaire and skin tests were performed. Cough was the commonest presenting symptom and upper respiratory tract infections, exercise and cold weather the commonest symptom precipitants. The relative incidences of the other precipitants reflected the environment of the study population. Associated atopic conditions were present in 75,5% of patients and a family background in 22,2%. Other respiratory diagnoses were commonly made, particularly tuberculosis, which was diagnosed in 7,4%. Fewer than one-third had no positive skin reaction. The commonest allergens were grasses, pollen and house-dust mites. The high proportion of house-dust mite sensitivity (44,2%) contradicts beliefs that they are rare at higher altitudes.**

*S Afr Med J* 1995; **85:** 999-1001.

Asthma is perceived to be rare in black children, and where it exists the condition is different from that of their white counterparts.[1] In addition, asthma in children is still poorly recognised and consequently undertreated.[2] In black children in South Africa, in whom both pneumonia and tuberculosis remain significant problems,[3,4] failure to recognise asthma may not only result in continued suffering but also subject the child to unnecessary medication.

Although there are few population-based prevalence studies of asthma in blacks in South Africa,[5] experience at asthma clinics suggests that it may be as common among black as it is among white children. Furthermore, urbanisation and passive smoke exposure have been implicated in the global increase in childhood asthma.[5-6] As these are increasing in the black population, particularly in the Soweto area which our hospital serves, it is possible that asthma will become more prevalent in this community. We undertook a study at the Baragwanath Hospital asthma clinic to describe the nature of asthma in black children.

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## Patients and methods

Four hundred and fifty-five black patients attending the Baragwanath Hospital children's asthma clinic were prospectively studied over the 18-month period November 1991 to May 1993. This is an almost entirely urban population as most patients (97,5%) came from greater Soweto where they had been resident their entire lives.

Patients were enrolled at the clinic as suspected or diagnosed asthmatics, having been referred from the outpatient department, the paediatric wards post-admission or Soweto clinics. The diagnosis was confirmed at the clinic on the basis of history and response to treatment. Confirmatory factors such as a history or clinical evidence of atopy were also considered. In patients who were capable, pulmonary function tests (peak flow rates and spirometry) were performed and, where necessary, airway reversibility was used as confirmation for the diagnosis of asthma.

The clinical data were recorded at each patient's initial clinic visit by means of a standardised questionnaire. Current clinic patients were 're-admitted' on the basis of the questionnaire's findings in order to obtain a complete record of the clinic. The questionnaire recorded patient demographic data such as address, age and sex. The respiratory history included presenting symptoms and their precipitants, other respiratory diagnoses and associated atopic history (hay fever, conjunctivitis, eczema and food allergy). The precipitants enquired about were upper respiratory tract infections, exercise, weather changes, food and drink, pollen and animals. Relevant environmental details were also sought. A family background of atopy (asthma, hay fever and/or eczema) was elicited from first- and second-degree relatives.

Skin-prick testing was performed in 242 patients; Hollister-Stier allergen extracts (Bayer Miles) with 0,5% phenol (negative control) and 1% histamine (positive control) and several common aero-allergens were used. The following allergen extracts were used: Bermuda grass, corn pollen, 5 grass mix, tree mix, *Candida albicans, Aspergillus fumigatus,* cat-hair epithelium, dog-hair dander, feather mix, house-dust mix and standardised mite *Dermatophagoides pteronyssinus*. Reactions were measured according to weal size at 10 minutes. Any weal greater than that of the negative control was regarded as positive.

## Results

Of the 455 patients at the clinic, 277 (60,9%) were boys, giving a ratio of boys to girls of 1,6:1. The mean (±SD) age was 7,26 ± 3,5 years with a range of 1 month - 17 years.

Presenting symptoms are shown in Fig. 1. The precipitants of wheeze are shown in Fig. 2. The frequency with which these factors triggered wheeze was comparable to that for recurrent cough (data not shown).

In addition to their asthma, 248 children (54,5%) had a history of hay fever, 165 (36,3%) of conjunctivitis, 85 (18,7%) of eczema and 69 (15,5%) of reactions to food. A history of an allergy was present in 344 children (75,5%). A family history of atopy was present in 101 children (22,2%).

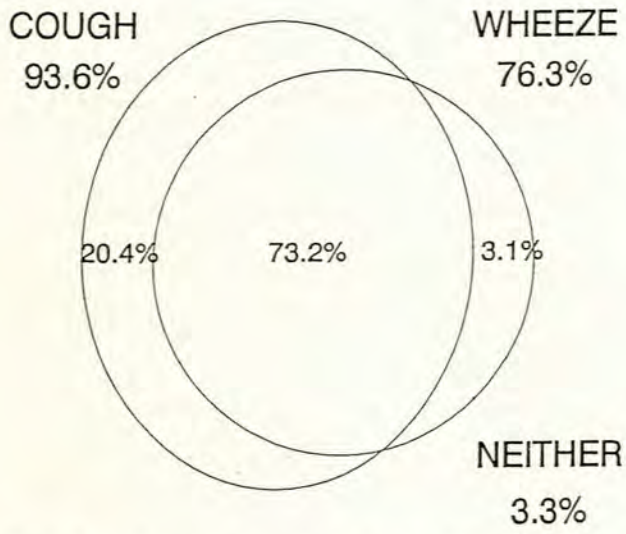


**Fig. 1. Presenting symptoms in 455 asthmatic children.**

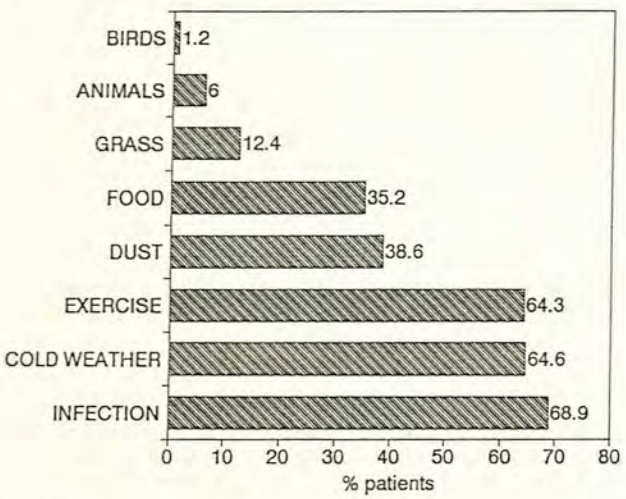


**Fig. 2. Precipitants of wheeze in 347 asthmatic children.**

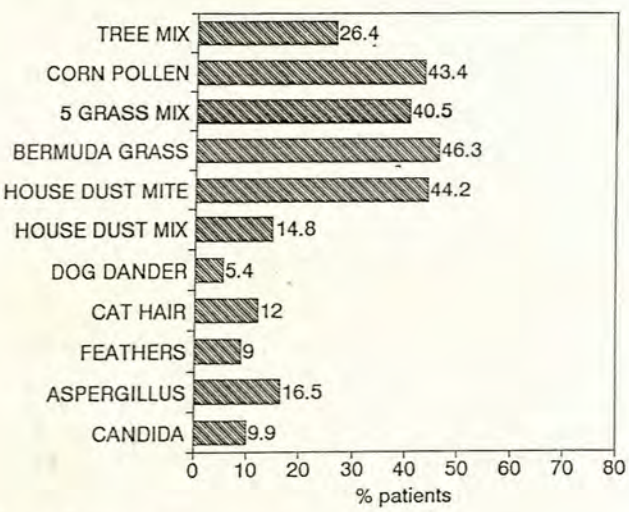


**Fig. 3. Results of skin tests in 242 asthmatic children.**

The proportions of children with a past history of other respiratory diagnoses were as follows: bronchiolitis in 101 (22,2%), bronchitis in 98 (21,5%), pneumonia in 75 (16,5%) and tuberculosis in 34 (7,4%).

Cigarette smoking was recorded in 233 (51,2%) homes and pets in 148 (32,5%). Fifty children (11,0%) slept on feather pillows and parents described dusty conditions in 188 homes (41,3%).

Of the patients who were skin-tested, 73 (30,2%) were negative to all allergens. The results of the skin-prick tests are shown in Fig. 3.

## Discussion

This study is the first to describe the nature of asthma in black children from an inland urban community in South Africa. The findings contradict long-held beliefs about asthma in black children and inland communities, as many of these findings are comparable to those in both white and coastal patient populations.

Most prevalence studies on asthma in First-World communities describe a male predominance, usually with a male/female ratio of 3:2.[9,10] However, both Van Niekerk *et al.*[5] and Carswell *et al.*[11] found in their studies of black asthmatic children either an equal gender distribution or a female predominance. In contrast, the gender distribution of this study is in keeping with that in developed, predominantly white, communities.

Although cough is thought to be a less classic symptom of childhood asthma than wheeze,[12] more patients presented with recurrent cough (93,6%) than with wheeze (73,3%). Indeed some 20,4% had a history of recurrent cough only, in keeping with the descriptions of cough-specific asthma.[13-15] The failure of doctors to recognise cough as a common marker of asthma in children may explain the continued underdiagnosis of asthma. These children, with their persistent symptoms, may consequently be given alternative respiratory diagnoses. A high proportion of patients in this clinic had previously been diagnosed as having pneumonia (16,5%) and bronchitis (21,5%). Of greater concern is that in 34 (7,4%), tuberculosis had been diagnosed. These children were subsequently diagnosed as asthmatic when their respiratory symptoms, which had persisted after a full course of therapy for tuberculosis, responded to asthma therapy.

As in other studies in asthmatics, upper respiratory tract infections and exercise were common triggers of wheezy episodes.[9] However, the rates with which the other examined triggers precipitated symptoms are unique to the study population and seem to reflect their environment. Almost 40% of patients reported dust as a precipitant. This usually referred to the dusty conditions in which these children live rather than to house dust, an entity not considered separately. In addition only 1 in 10 children had symptoms attributable to grass. This may be a reflection of their environment, where there is little grass, and possibly also their parents' failure to associate grass with symptoms. Similarly, the very low reactivity to animals and birds is indicative of the infrequency with which these children are exposed to them. Only one-third of homes reported keeping pets; the majority of these were dogs and were kept outside.

Food was considered a symptom trigger in more than one-third of patients. Parents felt that the main agents responsible were artificially flavoured cold-drinks and iced 'slush', a Soweto children's delicacy. The slush is made up by vendors from ice, sugar and commercially available concentrated flavouring and packed into plastic bags. The foodstuffs more commonly associated with allergy such as milk, eggs, wheat and nuts were not implicated as precipitants.

A noticeable finding was the high frequency of allergy in these children. This is contrary to the often expressed view that allergy is rare in black children,[1] and less common in children living in inland areas.[16] Seventy-five per cent of patients reported allergic symptoms, most of which were due to hay fever. However, the frequency of eczema was low (17,1%), reflecting possibly the age of the children at the clinic. Eczema commonly occurs in infancy and thereafter may disappear. Consequently parental recall of these distant events might be incomplete. These findings are comparable to the incidences described in white children in Bloemfontein.[16] This city, like Soweto, is situated in the grasslands of South Africa and has similar climatic conditions. This general comparability of atopy in asthmatic black and white children in similar environments would therefore seem to suggest that the differences are not of racial origin.

In striking contrast to these similarities, only 22,2% reported a positive family history of some form of atopic disease among first-degree relatives. This is much lower than the 91% of children in Bloemfontein[16] and the findings of other studies that quote incidences upwards of 40%.[17-19] However, studies of migrant asthmatics whose families have moved from underdeveloped to urban environments also report low incidences of an atopic background in the first-generation immigrants.[5,6,20] As there has been recent urbanisation among blacks in South Africa, the infrequency of a family history of atopy among children in Soweto is in keeping with these reports.

At least one positive skin-test reaction occurred in 70% of the patients tested. Among the allergens tested, grasses (5 grass mix and Bermuda) and pollen sensitivity occurred in over 40% of patients. This is hardly surprising as major components of the vegetation on the South African Highveld are natural grasses and cultivated cereals which pollinate for about 8 months of the year.[21] By comparison, patients studied in Bloemfontein had similarly high prevalences of sensitivity and pollens.[16] In the Cape Peninsula, a coastal area, only 7% of patients tested were positive to pollens.[22]

The moulds, aspergillus and candida were less frequent causes of skin-test positivity, possibly because the Highveld's warm dry climate is less conducive to their growth. The test results for animal danders reflected the low frequency with which families in Soweto keep household pets.

An unexpected finding was the high prevalence of house-dust mite skin-test positivity. Previous reports have suggested that house-dust mites do not thrive at high altitudes because of the low humidity.[23] In the Bloemfontein study, it was claimed that those patients shown to be positive had lived at the coast and been sensitised during that time.[16] As our population, almost without exception, had been resident in Soweto throughout their lives, sensitisation must have occurred there. Presumably, although the outdoor environment is dry, the indoor environments created as a consequence of heating are sufficiently warm and humid to sustain house-dust mites. However, the level of *Dermatophagoides pteronyssinus* antigen has never been measured in Soweto; in the light of these findings, this clearly requires investigation.

In conclusion, an audit of this nature is important as it has dispelled many misconceptions about asthma among blacks and highlighted their similarity to their white counterparts in this regard. Differences between patient populations seem more likely to be environmental than racial.

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Accepted 27 Oct 1994.