

Prevalence of childhood asthma and allergic diseases in Ankara, Turkey

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The first epidemiologic survey of the prevalence of childhood asthma and other allergic disease in Ankara, Turkey, was done in May 1992. A questionnaire on factors influencing the atopic status and allergic symptoms was distributed to parents of 1226 children aged 6–12 years. In this questionnaire, parents were asked to give information about physician-diagnosed asthma and atopic dermatitis (AD), and self-reported wheezing and rhinoconjunctivitis (perennial or seasonal). The overall response rate was 85% and included 502 boys (48.5%) and 534 girls (51.5%). The lifetime prevalences of asthma, wheezing, rhinoconjunctivitis, and AD were 17.4%, 23.3%, 28%, and 6.1%, respectively, and the reported prevalences for the last 12 months were 8.3%, 11.9%, 15.4%, and 4%, respectively. Asthma and other allergic disease had been recognized in 23.2% of the children during the last year; in half of these, more than one disease was present. Eight percent of the families kept pet animals; 95.4% of children had been breast-fed, of whom 61% for more than 6 months; and at least one person smoked at home in the case of 73.9% of children. Some health insurance was available to 72.8% of the families. Cumulative prevalences of wheezing, rhinoconjunctivitis, and AD were significantly associated with the presence of pets, passive smoking at home, and absence of health insurance. The prevalence of asthma was not affected by any of these factors except atopic family history. In conclusion, asthma and other allergic diseases constitute a major health problem for schoolchildren in Ankara.

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Among the most common disorders affecting children are allergic diseases, of which prevalence rates differ among countries and even among regions within the same country. In general, the prevalence of allergic diseases in Europe and North America is reported to be 10.0–25.5% (1, 12). Bronchial asthma is the most thoroughly investigated allergic disease, and has a reported prevalence of 2.5–11.1% among schoolchildren (4, 14). The prevalences of rhinoconjunctivitis, wheezing, and atopic dermatitis (AD) are 9–23.5% (1, 3), 6.3–28.6% (3, 16), and 1.7–17% (1, 3, 15), respectively. The discordances among the prevalences of the same disorder in various reports are customarily explained by differences in ethnic groups, climates, various other environmental factors, and breast-feeding, and by methodologic discrepancies among studies (6, 7). The aim of the present survey of Turkish schoolchildren was to determine both the lifetime and current prevalences

(past 12 months) of allergic disease, and the relation of factors such as keeping pet animals, passive smoking, breast-feeding, and lack of health insurance with these prevalences.

Material and methods

We surveyed 1226 children aged 6–12 years in the first five grades of a randomly selected primary school in Ankara, Turkey, in this study, which was completed in May 1992. A questionnaire was distributed to children to be completed by their parents. The questionnaire included questions to establish the following points: whether the child had been diagnosed as having asthma or AD by a physician either during the last 12 months or before, whether seasonal or perennial rhinoconjunctivitis or wheezing had been observed by the parents, whether there were pet animals at home, breast-feeding duration,

atopic family history, smoking at home, and health insurance coverage (Appendix 1). The presence of allergic symptoms in a first-degree relative was regarded as a positive family history. Of the 1226 children, 1036 brought back the forms (84.5%).

Comparisons were made by Student's *t*-test, and 95% confidence limits were calculated for the differences where appropriate.

Results

Of the 1036 children who agreed to participate in this investigation, 502 (48.5%) were boys and 534 girls. The age and sex distribution of the study group is shown in Table 1. The pupils of the state primary school were children of middle-class families. The families of 754 children had had some type of health insurance. Demographic factors affecting prevalence are shown in Table 2. The cumulative prevalence and prevalence of the last 12 months of asthma and other allergic disease of 1036 children are shown in Table 3. Occurrences were similar in boys and girls. Correlation of the cumulative and current prevalence with the various risk factors is shown Table 4.

In the study group, 240 children (23.2%) had been diagnosed as having either asthma or other allergic disease during the last 12 months. Of these, 50% (120 children) had more than one allergic disorder. Wheezing or asthma was reported in 14.3% of the study group during the same period. The families of 82 children (7.9%) had pet animals at home, birds being the most common (27 families). Twenty families had cats, 18 had fish, 11 had dogs, and six had rabbits or turtles. Of the study group, 988 (95.4%) children had been breast-fed during infancy or early childhood. Of these, 385 (39%) had been breast-fed for less than 7 months, and 603 for 7 months or more.

The results showed that parents or other relatives at home of 766 children (73.9%) were smokers. Among these, there was only one smoker at home for 525 children, two smokers at home for 215 chil-

Table 2. Demographic factors affecting prevalence

Factors	n = 1036 (%)
Pet animals	82 (7.9)
Breast-feeding	988 (95.4)
Passive smoking	766 (73.9)
Atopic family history	212 (20.5)
Health insurance	754 (72.8)

Table 3. Cumulative prevalence and prevalence of last 12 months of asthma and other allergic disease of 1036 children in Ankara

	Cumulative prevalence		Last 12 months prevalence	
	n	% (95% CI)	n	% (95% CI)
Asthma	180	17.4 (15.1, 19.8)	86	8.3 (6.7, 10.2)
Wheezing	241	23.3 (20.7, 26.0)	123	11.9 (10.0, 14.0)
Rhinitis	290	28.0 (25.3, 30.8)	159	15.4 (13.1, 17.7)
Atopic dermatitis	63	6.1 (4.7, 7.7)	41	4.0 (2.9, 5.3)

Table 4. Correlation of cumulative (lifetime) and current prevalence (prevalence for last 12 months) with various risk factors

	Cumulative prevalence				Current prevalence			
	A	W	R	AD	A	W	R	AD
Pet animals	NS	S	S	S	NS	NS	S	S
Breast-feeding	NS	NS	NS	NS	NS	NS	NS	S
Passive smoking	NS	S	S	S	NS	NS	NS	NS
Atopic family history	S	S	S	S	NS	NS	NS	NS
No health insurance	NS	S	S	S	NS	NS	NS	NS

S, significant (*P*<0.05); NS, nonsignificant; A, asthma; W, wheezing; R, rhinoconjunctivitis; AD, atopic dermatitis.

dren, and more than two smokers at home for the remaining children.

A history of atopic heredity was detected in 212 families (20.5%). Cumulative prevalences of wheezing, AD, and rhinoconjunctivitis were significantly associated with passive smoking, pet animals, enrolment in a health insurance program (*P*<0.05), or more than one of these factors. All the allergic disorders were significantly more frequent in children with a family history of atopic heredity (*P*<0.05). The prevalence of wheezing in children was significantly associated with the number of parents smoking at home (*P*<0.05). The prevalence of asthma was not affected by any factor except family history of atopy.

Interestingly, the current prevalence of AD was significantly lower in the breast-fed group than the non-breast-fed group. Current prevalence of rhinoconjunctivitis and AD was significantly lower in the group who did not have pets than in the one who did.

Table 1. Demographic data of study group

Age (years)	Girls		Boys		Total	
	n	%	n	%	n	%
6	2	0.4	4	0.8	6	0.6
7	75	14.1	70	13.9	145	14.0
8	97	18.2	91	18.1	188	18.2
9	111	20.8	108	21.5	219	21.1
10	107	20.0	91	18.1	198	19.1
11	103	19.3	101	20.1	204	19.7
12	39	7.3	37	7.4	76	7.3
Total	534		502		1036	

Discussion

The debate continues over the definition of bronchial asthma. However, we were satisfied with the diagnosis of bronchial asthma established by the physicians who had examined the children previously. Although physicians commonly specify “wheezy bronchitis”, “spastic bronchitis”, “bronchiolitis”, etc. to describe the disease in hospital records, they frequently inform the family only of “asthma” because it is the disease best known in the community. We used the same criteria for AD. On the contrary, wheezing and rhinoconjunctivitis can be easily observed by the parents, who often do not seek medical attention for these disorders. Therefore, the diagnoses of wheezing and rhinoconjunctivitis were derived from the responses of the parents. All of the questions were direct questions that excluded private matters or exaggerated responses from the study group.

The current prevalence of asthma and other allergic diseases found in this study was 23.2%, which was not as high as in some previous studies (32.6–46%) (9, 10), but did agree closely with others (24–25.5%) (1, 17). The cumulative and current prevalences of AD in this study (6.1% and 4%, respectively) are lower than those found in Western European countries (17). This difference could be due to late exposure of children who were breast-fed for at least for 6 months to external antigens contained in food or food additives (13, 17), or to a study design in which the results are based upon a questionnaire.

The cumulative and current prevalences of rhinoconjunctivitis and wheezing were similar to the reported prevalences in Western European countries. That of bronchial asthma was a little higher than in these countries. There has been no previous study of the prevalence of childhood asthma in Turkey. However, a recent study of Turkish immigrants in Sweden reported a cumulative prevalence of 15.5% for asthma in 205 persons aged 15–76 years (11). The pathogenetic role of differences in nutrition and sodium intake is still controversial (5).

Passive smoking appears to be one of the most important factors affecting children’s health. This is a major public health problem in Turkey, as reflected by both the high rate of smoking (approximately 60% and 24% of men and women, respectively) and the high incidence of children (73.9% in our study) exposed to cigarette smoke at home. Cumulative prevalences of wheezing, rhinoconjunctivitis, and AD were closely related to passive smoking, and the cumulative prevalence of wheezing apparently increased with the number of persons smoking at home. In contrast to previous studies, the prevalence of asthma was not influenced by passive smoking at

home (8, 18). Keeping pets is not common in Turkey; however, it is notable that the cumulative prevalences of wheezing, rhinoconjunctivitis, and AD were higher in children with pets, as also documented in the literature (2). Moreover, the current prevalence of rhinoconjunctivitis and AD was significantly higher in this group. However, asthma and wheezing prevalences were not affected.

Wheezing, rhinoconjunctivitis, and AD were more prevalent in the children of families that were not insured. The effect of health insurance coverage on the health of children is still unclear. However, the lack of health insurance is a major risk factor for allergic diseases for one of every four children living in Ankara.

In conclusion, both asthma and other allergic diseases are a major pediatric health problem in Ankara. The high prevalence of smoking, the lack of effective health insurance, the keeping of pet animals, and atopic family history in Turkey have both direct and indirect influences on children.

Appendix 1. Questionnaire

Name and sex:

Born (year, month, date):

School/grade:

Has your child ever had:	No	Yes
Asthma diagnosed by the physician?		
Eczema diagnosed by the physician?		
Wheezing (observed by the parents)?		
Perennial/seasonal rhinoconjunctivitis (observed by the parents)?		
If the answer is yes to any of the above questions		
Age of onset		
Age of last symptoms		
Symptoms last 12 months	No	Yes
Do you have pets or other animals at home?	No	Yes
If yes, which		
Breast-feeding after delivery	No	Yes
If yes, duration months		
Smoker at home	No	Yes
If yes, number		
Has any other family member ever had allergic symptoms? (asthma or wheezy bronchitis, seasonal/perennial rhinoconjunctivitis, eczema)		
If yes, Mother		
Father		
Sibling		

Date of completing questionnaire

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Parent’s signature

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