

THE PREVALENCE OF ASTHMA AND OTHER ALLERGIC DISEASES IN A PROVINCE OF TURKEY*

Şükrü Küçüködük MD**, Murat Aydın MD***, Feyzullah Çetinkaya MD***
Hüseyin Dinç MD****, Nuran Gürses MD**, Yıldız Saraçlar MD*****

SUMMARY: KÜÇÜKÖDÜK Ş, AYDIN M, ÇETINKAYA F, DİNÇ H, GÜRSER N, SARAÇLAR Y. (Department of Pediatrics, Ondokuz Mayıs University Faculty of Medicine, Samsun, Turkey). The prevalence of asthma and other allergic diseases in a province of Turkey. Turk J Pediatr 1996; 38: 149-153.

To document the prevalence of asthma and other allergic disorders among children, a questionnaire study involving 3,118 children aged six to 14 years was done. The overall prevalence of allergic diseases was 27.4 percent and the prevalence of each disorder was as follows: rhinitis 11 percent, asthma 10.2 percent, conjunctivitis 7.1 percent, and skin diseases 6.3 percent. Atopic diseases were reported most commonly among the families of children with allergic rhinitis. When compared with internal regions of Turkey, the prevalence of allergic diseases was found to be very high. It was concluded that allergic diseases are an important health problem among children in our region. *Key words: allergic diseases, asthma, childhood, prevalence.*

Asthma and other allergic disorders are a leading cause of morbidity in children all over the world¹⁻³. The prevalence of asthma and other allergic diseases is increasing in industrialized countries⁴⁻⁶, but the situation in developing countries is not known.

In this report the prevalence of asthma and other allergic diseases in Samsun, a province of Turkey in the Black Sea region, was investigated with an internationally standardized questionnaire.

Material and Methods

A total of 3,500 children aged six to 14 years were chosen for the survey. The study was done in seven elementary schools located in districts with different socioeconomic levels. A standard questionnaire, which was modified from three worldwide known questionnaires⁷⁻⁹, was distributed to the students for completion by their parents. The questionnaire included questions related to demographic data, symptoms of bronchial hyperreactivity and asthma, allergic rhinitis, allergic conjunctivitis, skin allergies and any atopic disease in a first-degree relative. In

* From the Department of Pediatrics, Ondokuz Mayıs University Faculty of Medicine, Samsun.

** Professor of Pediatrics, Ondokuz Mayıs University Faculty of Medicine.

*** Assistant Professor of Pediatrics, Ondokuz Mayıs University Faculty of Medicine.

**** Pediatrician, Ondokuz Mayıs University Faculty of Medicine.

***** Professor of Pediatrics, Hacettepe University Faculty of Medicine, Ankara.

the questionnaire, hay fever or seasonal allergic rhinitis was defined as itchy, runny nose associated with paroxysms of sneezing, and itchy, allergic conjunctivitis as runny eyes in the spring and summer. Skin allergies were likened to any itchy, red rash in the crease of elbows and knees and on the cheeks. The presence of asthma was indicated by an affirmative response to the following questions: 1. Has your child been diagnosed with asthma by a doctor? 2. Do any of the following make your child start to wheeze or cough: flowers or trees, animals, exercise, smoke, cold or foggy air? 3. Does your child cough frequently during the night? 4. Does your child use any anti-asthmatic drug? 5. Does your child produce sputum in the morning? Associations between the reported symptoms and the putative risk factors-age, sex, atopy, parental allergic symptoms, skin allergies and asthma were assessed using chi-square test with SPSS (The Statistical Package for the Social Sciences) statistical program. A p level < 0.05 was considered to be statistically significant.

Results

A total of 3,118 replies from 1,514 females and 1,604 males were received from the 3,500 questionnaires sent, representing an overall response rate of 89 percent. The mean age of the subjects was 9.3 ± 1.5 years (range 6-14 years). The age and sex distribution of the subjects are shown in Table I. The overall prevalence of allergic diseases was 27.4 percent, and the prevalence of each diseases was as follow: rhinitis 11 percent, asthma 10.2 percent, conjunctivitis 7.1 percent and skin allergies 6.3 percent (Table II). In one-third of children with rhinitis, other disease were present as well. The disease associations were as follows: skin allergies plus rhinitis was diagnosed in 138 subjects (4.4%). rhinitis plus conjunctivitis in 135 subjects (4.3%), rhinitis plus asthma in 110 subjects (3.5%), skin allergies plus asthma in 79 subjects (2.5%) and skin allergies plus conjunctivitis in 115 subjects (3.7%). No significant difference in age or gender was found among either asthmatic or healthy subjects (X^2 test, $p > 0.05$). The children with rhinitis had the highest rate of parental histories of allergic symptoms percent (Table III). A positive family history of the same atopic disease was reported in 40.6 percent of asthmatic children, in 38 percent of children with rhinitis, in 41.6 percent of children with skin allergies and in 35.6 percent of children with conjunctivitis (Table III).

Table I: Age and Sex Distribution of the Subjects

Age Group	Girls (%)	Boys (%)	Total (%)
6-7 years	219 (14.6)	274 (17.0)	493 (15.8)
8-9 years	545 (36.2)	566 (35.0)	1,111 (35.6)
10-11 years	651 (43.3)	659 (40.8)	1,310 (42.2)
12-14 years	88 (5.9)	116 (7.2)	204 (6.5)
Total	1,503 (100)	1,615 (100)	3,118 (100)

Table II: Distribution of Disorders According to Age and Sex

Diagnosis	Girls (%)	Boys (%)	Total (%)
Asthma	118 (45.9)	138 (54.1)	256 (8.2)
Rhinitis	197 (46.5)	227 (53.5)	424 (13.6)
Conjunctivitis	154 (49.2)	158 (50.8)	312 (10.0)
Skin allergies	198 (49.5)	201 (50.5)	399 (12.8)

Table III: Parental Allergic Symptoms and Reported Allergic Diseases in Subjects

Clinical Diagnosis in Subjects	Parental Allergic Symptoms		
	Asthma	Rhinitis	Skin Allergies
Rhinitis (n: 427)	162 (38%)	159 (37.2%)	95 (22.2%)
Skin allergies (n: 399)	166 (41.6%)	130 (32.6%)	107 (26.8%)
Conjunctivitis (n: 312)	111 (35.6%)	131 (42%)	72 (23%)
Asthma (n: 256)	104 (40.6%)	86 (33.6%)	54 (21.1%)

Discussion

The lack of a gold standard for the diagnosis of asthma and other allergic diseases makes accurate assessment and comparison of prevalence rates between populations difficult^{10, 11}. Some studies have used similar survey methods in different areas and found evidence that developed countries and communities seem to have more asthma than those that are underdeveloped^{12, 13}.

Studies have recently been done in an attempt to document the prevalence of asthma and other allergic diseases in Turkey^{14, 15}.

A study with the same questionnaire done by Saraçlar et al.¹⁴ in Ankara including 3,024 primary school children revealed the prevalence of asthma as 6.9 percent, allergic rhinitis as 11.7 percent, allergic conjunctivitis as 4.6 percent and allergic skin diseases as 2.6 percent. Another study with a different questionnaire by Kalyoncu et al.¹⁵ reported higher prevalence. In the present study the overall prevalence of allergic diseases was 27.4%; allergic rhinitis was the most common clinical diagnosis and was usually associated with other allergic diseases. However, it is possible that none of these studies reflects the current prevalence of allergic diseases in our country, due to the geographic and socioeconomic differences in various regions of Turkey. It has been reported that the prevalence of asthma varies in different geographic locations^{16, 17}, but evidence is sparse owing to the lack of multicenter surveys using common protocols. Burr et al¹⁶. conducted a survey with the same questionnaire in 4,353 children living in defined areas of New Zealand, Wales, South Africa and Sweden and found the prevalence

of asthma as follows: 16.8 percent of children in New Zealand, 12.0 percent in Wales, 11.5 percent in South Africa and 4.0 percent in Sweden. These authors concluded that the prevalence of asthma in children showed geographical variation which is parallel to that of asthma mortality. Samsun is located in northern Turkey and the weather is rainier than in internal regions of Turkey. The discrepancy between data from Ankara and Samsun may result from climatic differences. Moreover, while it has been reported that asthma was more common in boys than in girls^{18, 19}, we found no significant difference between the genders ($p > 0.05$).

Studies of familial aggregation of asthma have shown an increased prevalence of asthma among first-degree relatives of an index subject^{20, 21}. Sibbald et al.²⁰ reported an increased prevalence of asthma among first-degree relatives of asthmatic children compared with relatives of nonasthmatic children evaluated in a general practice. Foucard and Sjöberg²¹ found that infants and children with wheezy bronchitis and a family history of asthma or allergy had twice the risk of developing persistent asthma of those without such a family history. In our study the least atopic diseases were seen in the families of children with asthma, and the most in the families of children with allergic rhinitis.

Increasing prevalence and mortality of asthma have been reported in several studies²²⁻²⁴. An increase of 28 percent in current asthma has been found among children six to 16 years of age in a survey in the United States²². A more significant increase (90%) has been reported between 1969 and 1982 in New Zealand²³. Mortality from asthma reportedly increased 4.7 percent every year in the five to 34-year age group between 1974 and 1984 in England²⁴. The increase in neither the prevalence nor the mortality can be explained precisely.

The evidence from this study suggests that asthma and other allergic diseases are important childhood health problems in Samsun, similar to some other places in the world, and we need more comprehensive and longitudinal studies to document the current prevalence of asthma and allergic diseases in Turkey.

REFERENCES

1. Evans R. Epidemiology and natural history of asthma, allergic rhinitis, and atopic dermatitis. In: Middleton E, Reed C (eds). *Allergy: Principles and Practice* (4th ed.) Vol. 2. St. Louis: Mosby-Year Book Inc, 1993: 1109-1136.
2. Leung R, Jenkins M. Asthma, allergy and atopy in southern Chinese school students. *Clin Exp Allergy* 1994; 24: 353-358.
3. Mutius EV, Fritzsche C, Weiland SK, et al. Prevalence of asthma and allergic disorders among children in United Germany: a descriptive comparison. *Br Med J* 1992; 305: 1395-1399.
4. Halfon N, Newacheck PW. Trends in the hospitalization for acute childhood asthma, 1970-1984. *Am J Public Health* 1986; 76: 1308-1311.
5. Kjellman B, Pettersson R, Hensji B. Allergy among school children in a Swedish country. *Allergy* 1982; 37 (suppl 2): 5-6.

6. Lee DA, Winslow NR, Speight AN, Hey EN. Prevalence and spectrum of asthma in childhood. *Br Med J* 1983; 286: 1256-1258.
7. Epidemiology standardization project. *Am Rev Respir Dis* 1978; 118: 1-120.
8. Samet JM. A historical and epidemiological perspective on respiratory symptoms questionnaires. *Am J Epidemiol* 1978; 108: 435-446.
9. Helsing KJ, Comstock W, Speizer FE, et al. Comparison of three standardized questionnaires on respiratory symptoms. *Am Rev Respir Dis* 1979; 120: 1221-1231.
10. Robertson CF, Bishop J, Sennhauser FH, Mallol J. International comparison of asthma prevalence in children: Australia, Switzerland, Chile. *Pediatr Pulmonol* 1993; 16: 219-226.
11. Pearce N, Weiland S, Keil U, et al. Self-reported prevalence of asthma symptoms in children in Australia, England, Germany and New Zealand: an international comparison using the ISAAC protocol. *Eur Respir J* 1993; 6: 1455-1461.
12. Waite DA, Eyles EF, Tonkins SL, O'Donnell TV. Asthma prevalence in Tokelauan children in two environments. *Clin Allergy* 1980; 10: 71-75.
13. Keeley DJ, Neill P, Gallivan S. Comparison of the prevalence of reversible airways obstruction in rural and urban Zimbabwean children. *Thorax* 1991; 46: 549-553.
14. Saraçlar Y, Yiğit Ş, Adalıoğlu G, Tuncer A, Tunçbilek E. Prevalence of allergic diseases in school children in Ankara (Turkish). *Çocuk Sağlığı ve Hastalıkları Dergisi* 1994; 37: 215-226.
15. Kalyoncu AF, Selçuk ZT, Karakoca Y, et al. Prevalence of childhood asthma and allergic diseases in Ankara, Turkey. *Allergy* 1994; 49: 485-488.
16. Burr ML, Limb ES, Andrae S, et al. Childhood asthma in four countries: A comparative survey. *Int J Epidemiol* 1994; 23: 341-347.
17. Andrae S, Axelson O, Björkstén B, Fredriksson M, Kjellman NI. Symptoms of bronchial hyperreactivity and asthma in relation to environmental factors. *Arch Dis Child* 1988; 63: 473-478.
18. Mak H, Johnston P, Abbey H, Talamo RC. Prevalence of asthma and health service utilization of asthmatic children in an inner city. *J Allergy Clin Immunol* 1982; 70: 367-372.
19. Sears MR, Jones DT, Silva PA, et al. Asthma in seven year old children: a report from the Dunedin Multidisciplinary Child Development Study. *NZ Med J* 1982; 95: 533-536.
20. Sibbald B, Horn ME, Greeg I. A family study of the genetic basis of asthma and wheezy bronchitis. *Arch Dis Child* 1980; 55: 354-357.
21. Foucard T, Sjöberg O. A prospective 12-year follow-up study of children with wheezy bronchitis. *Acta Paediatr Scand* 1984; 73: 577-583.
22. Halfon N, Newacheck PW. Trends in the hospitalization for acute childhood asthma, 1970-1984. *Am J Public Health* 1986; 76: 1308-1311.
23. Mitchell EA. Increasing prevalence of asthma in children. *NZ Med J* 1983; 96: 463-464.
24. Burney PG. Asthma mortality in England and Wales: evidence for a further increase, 1974-1984. *Lancet* 1986; 2: 323-326.