

Prevalence of Asthma and Asthma-Like and Allergic Symptoms in the Urban Adult Population of Elazığ

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Abstract: The aim of this study was to determine the prevalence of asthma, asthma-like symptoms and atopy in the adult population of the city of Elazığ. A specific questionnaire, adopted from the European Community Respiratory Health Survey including social status and smoking tendencies of people was filled in by 2454 randomly chosen (1088 male, 1366 female) subjects. The cumulative prevalence of asthma and asthma-like symptoms for males, females and the general population was 22.0%, 28.7%, and 25.7%, respectively. The periodic prevalences of them were 17.3%, 20.5%, and 19.1%, while rates of previously diagnosed asthma were 2.6%, 3.5%, and 3.1%. Subjects suffering from allergic symptoms constituted 21.0% of males, 25.5% of females and 23.6% of the total. The rates of seasonal rhinoconjunctivitis were 7.5%, 8.7%, and 8.2%, while the rates of

perennial catarrh were 4.0%, 3.9%, and 3.9%, respectively. The rates of eczema were found to be 5.0% for males, 4.9% for females and 4.9% for the general population. Among the subjects suffering from wheezing and shortness of breath at any time, 11.1% had received a diagnosis of asthma previously ($p < 0.001$). Similarly, 14.3% of subjects suffering from wheezing within the previous 12 months had been diagnosed as asthmatic ($p < 0.001$).

Our findings were parallel to those performed in different regions of Turkey. However, not all of the subjects suffering from asthma or asthma-like symptoms had been examined by chest physicians thoroughly in this study; therefore, the exact prevalence values need to be determined by large clinical studies.

Key Words: Asthma, asthma-like symptoms, prevalence

Introduction

Despite a better understanding of its pathophysiology and the new therapeutic methods that have emerged, the prevalence, morbidity and mortality of asthma is continuing to increase gradually all over the world (1-3).

The prevalence of asthma not only varies between countries but also between different regions within the same country (2,4).

Asthma is an important health care problem all over the world. In Turkey, research concerning asthma prevalence has been conducted more frequently in children than in adults. Most of it has been conducted in central and western parts of Turkey. There is no research in the literature revealing the rates in eastern Turkey (5).

The aim of this study was to determine the prevalence of asthma and asthma-like symptoms in the adult urban population of Elazığ, a city in eastern Turkey.

Materials and Methods

The research was conducted between January and April 1999, in order to measure the prevalence of asthma, and asthma-like symptoms seen in the adult urban population (250,000 in number) of an eastern city of Turkey, Elazığ. Among 2600 randomly chosen subjects, 2454 (94.5%) completed the questionnaire and constituted the study group. Specially educated health-care workers collected the data in 15 primary health-care centers. The questionnaire was adapted from the European Community Respiratory Health Survey (6), including questions about socio-economic status and smoking tendencies.

The asthma-like symptoms in the questionnaire were chest tightness, wheezing and shortness of breath (7). Definitions of the epidemiological terms used in this article are as follows.

Cumulative prevalence of symptoms of a particular disease means the number of people who had experienced those symptoms at least once in their life.

Periodic prevalence of a particular disease means the number of people who had experienced those symptoms within a period of time. This period is usually taken as "the last 12 months".

The proportional distribution of the analyzed parameters was determined for total and both gender groups. Collected data were analysed by X2-test using SPSS for Windows 8.0 software for statistical comparisons and $p < 0.05$ was considered as the level of significance.

Results

The average age of the subjects was 38.12 ± 12.17 (1366 females, average age: 36.31 ± 12.31 ; 1088 males average age: 40.39 ± 12.01).

The cumulative and periodic prevalence of asthma-like symptoms of the study population were 25.7% and 19.1%, respectively whereas the periodic prevalence of patients suffering from wheezing but who did not have a

common cold was 12.4%. Patients with wheezing together with dyspnea constituted 15.6% of the total. Among the female subjects, the cumulative and periodic prevalence of asthma and asthma-like symptoms were higher than those of their male counterparts ($p < 0.05$) (Table 1).

In total, the frequencies of nocturnal attacks such as dyspnea, coughing and compression in the chest were 13.8%, 25.4%, and 17.9%, respectively. These complaints were more common in female subjects ($p < 0.05$) (Table 2).

The rate of previously diagnosed asthma was higher in females than in males but this difference had no statistical significance ($p > 0.05$). In the general population, the frequency of asthma previously diagnosed by a physician was 3.1% and the periodic prevalence of asthma attacks in the previous 12 months was 2.1%. Regardless of sex, the frequency of anti-asthma drug use was 100% among patients diagnosed with asthma (Table 3).

	Cumulative Prevalence		Periodic Wheezing		Wheezing Without Cat.Cold*		Wheezing +Dyspnea	
	n	%	n	%	n	%	n	%
Female	392	28.7	280	20.5	181	13.3	247	18.1
Male	239	22.0	188	17.3	123	11.3	135	12.4
Total	631	25.7	468	19.1	304	12.4	382	15.6
χ^2 test**	P: 0.00015		P: 0.0437		P: 0.00018		P: 0.00017	

Table 1. The periodic and cumulative distribution of the findings for wheezing and dyspnea.

*Cat.Cold: catching cold, **compares the values of females and males in the related group.

	Nocturnal Attacks Having an Awakening Property					
	Compression in the Chest		Nocturnal Dyspnea		Nocturnal Coughing	
	n	%	n	%	n	%
Female	268	19.6	208	15.2	376	27.5
Male	171	15.7	130	11.9	248	22.8
Total	439	17.9	388	13.8	624	25.4
χ^2 test*	p: 0.01222		p: 0.01931		p: 0.0075	

Table 2. The distribution of nocturnal attacks.

*compares the values of females and males in the related group.

	Asthma Attack in the previous 12 Months		Using Asthma Drugs		Diagnosed as Asthmatic previously	
	n	%	n	%	n	%
Female	37	2.7	48	3.5	48	3.5
Male	15	1.4	28	2.6	28	2.6
Total	52	2.1	76	3.1	76	3.1
χ^2 test*	p: 0.0230		p: 0.1815		p: 0.1815	

Table 3. The distribution of some clinical properties of the subjects with asthma symptoms.

*compares the values of females and males in the related group.

	Female		Male		Total	
	n	%	n	%	n	%
Any kind of allergy	349	25.5	229	21.0	578	23.6
Allergic rhinoconj.*	119	8.7	82	7.5	201	8.2
Perennial rhinitis	53	3.9	43	4.0	96	3.9
Rashes	88	6.4	73	6.7	161	6.6
Eczema	67	4.9	54	5.0	121	4.9
Allergies from bee-stings	53	3.9	46	4.2	99	4.0
Allergies from foods	109	8.0	47	4.3	156	6.4
Allergies from drugs	76	5.6	31	2.8	107	4.4

Table 4. The distribution of some allergic peculiarities.

*rhinoconjunctivitis

Among the general population, 23.6% of subjects (25.5% of females, and 21.0% of males) had had allergic symptoms at some time in their life. Of these, in the female subjects, the frequency of allergic rhinoconjunctivitis was 8.7%, food allergies was 8.0% and rashes was 6.4%, while these rates were 7.5%, 4.3%, and 6.7% in male subjects respectively. In the general population, the frequency of allergic rhinoconjunctivitis was 8.2%, food allergies were 6.4% and rashes were 6.6% (Table 4).

The frequency of subjects with a positive history of allergies in their first-degree relatives was 10.3% in total, 11.5% in females, and 8.8% in males. As expected, among first-degree relatives, children constituted the most frequently involved subgroup (Table 5).

The cumulative prevalence of asthma-like symptoms in smokers was 25.2% (34.2% for females, and 20.7%

for males) and 26.0% in non-smokers (26.6% for females, and 24.4% for males), while the periodic prevalence of these was 19.2% in smokers (25.1% for females, and 16.2% for males) and 18.9% in non-smokers (18.7% for females, and 19.6% for males). In the female group, smoking increased the cumulative and periodic prevalence of asthma-like symptoms ($p < 0.01$) while it seemed not to affect those in the male group and in the study population in general (Table 6).

It was established that the level of monthly income changed neither the cumulative nor the periodic prevalence of asthma and asthma-like symptoms both in the male and the female groups and in the general population ($p > 0.05$) (Table 7).

A history of allergies increased to a statistically higher significance the cumulative and periodic prevalence of asthma-like symptoms ($p < 0.001$) (Table 8).

Allergic person	RESEARCH GROUP					
	Female		Male		Total	
	n	%	n	%	n	%
Mother	40	2.9	36	3.3	76	3.1
Father	38	2.8	19	1.7	57	2.3
Child	81	5.9	50	4.6	131	5.3
Sister/Brother	31	2.3	14	1.3	45	1.8
Aller. first relatives *	157	11.5	96	8.8	253	10.3
Aller. sec. relatives **	4	0.3	5	0.5	9	0.4

Table 5. The distribution of allergic peculiarities according to relationships.

* Aller. first relatives: Allergies in the first-grade relatives,
 ** Aller. sec. Relatives: Allergies in the second-grade relatives.

Table 6. The relation between smoking and asthma-like symptoms.

Smoking	Cumulative Prevalence						Periodic Wheezing					
	Female		Male		Total		Female		Male		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Smokers	125	34.2	151	20.7	276	25.2	92	25.1	118	16.2	210	19.2
Non smokers	265	26.6	87	24.4	352	26.0	186	18.7	70	19.6	256	18.9
χ^2 test	p: 0.00631		p: 0.1748		p: 0.6573		p: 0.00872		p: 0.1645		p: 0.8633	

Table 7. The distribution of asthma-like symptoms according to the level of monthly income.

Monthly Income Per Person	Cumulative Prevalence						Periodic Wheezing					
	Female		Male		Total		Female		Male		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
1-30 M.TL	279	29.5	177	23.5	456	26.8	205	21.7	134	17.8	339	20.0
31-99 M.TL	99	26.5	54	18.2	153	22.8	64	17.1	47	15.8	111	16.5
100 + M.TL	14	30.4	8	21.1	22	26.2	11	23.9	7	18.4	18	21.4
χ^2 test	p: 0.5308		p: 0.1702		p: 0.1277		p: 0.1527		p: 0.7354		p: 0.1395	

M.TL: Million Turkish Liras (Lira is Turkish unit money),

The rate of asthma diagnosed previously by physicians clearly increased both with the cumulative and periodic prevalence of asthma-like symptoms regardless of sex ($p < 0.001$) (Table 9).

Discussion

Together with a greater increase in childhood asthma, the prevalence of asthma in adults is increasing all over the world (3,8).

Table 8. The distribution of asthma-like symptoms in the subjects having some kinds of allergic symptoms.

History of Allergies	Cumulative Prevalence						Periodic Wheezing					
	Female		Male		Total		Female		Male		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Subjects Having Allergies	182	52.1	100	43.7	282	48.8	143	41.0	83	36.2	226	39.1
Subjects Not Having Allergies	210	20.6	139	16.2	349	18.6	147	13.5	105	12.2	242	12.9
χ^2 test	p=0.0001		p=0.0001		p=0.0001		p=0.0001		p=0.0001		p=0.0001	

Frequency of Symptoms	Received Asthma Diagnosis Previously					
	Female		Male		Total	
	n	%	n	%	n	%
Cumulative Prevalence	43	11.0	27	11.3	70	11.1
χ^2 test	p=0.0001		p=0.0001		p=0.0001	
Periodic Wheezing	41	14.6	26	13.8	67	14.3
χ^2 test	p=0.0001		p=0.0001		p=0.0001	

Table 9. According to the asthma-like findings, the frequency of having received an asthma diagnosis previously.

* Aller. first relatives: Allergies in the first grade relatives,

** Aller. sec. Relatives: Allergies in the second grade relatives.

Asthma prevalence varies widely in different geographic locations, probably reflecting the influences of changes in life styles, environmental conditions and possible genetic factors which have not been defined yet (7,9).

The prevalence of adulthood asthma in the USA was found to be 5-6% in 1994. Moreover, the European Community Respiratory Health Survey (ECRHS) pointed out that the periodic prevalence of asthma seen in young and middle-aged adults was 4.2% in Algeria, 8.5% in Italy, 29.8% in England, 32% in Ireland, 28.8% in Australia, 27.3% in New Zealand, and 27.5% in Oregon in the USA (2,4).

Most of the epidemiologic studies about asthma prevalence in Turkey have been conducted in recent years and have focused on childhood asthma. The limited number of studies on adults were conducted in the central and western regions of Turkey. There is no article in the

literature revealing the epidemiologic data of adult asthma in eastern Turkey (5,9).

The first of the studies to determine the epidemiologic parameters of asthma in Turkish adults was conducted on Turkish immigrants in Stockholm, Sweden, in 1990. The cumulative prevalence of asthma was 6.4%, according to the answers to a questionnaire; the same value was found to be 15.5% by direct interviews with a physician. The researchers emphasized the importance of the face-to-face interviews for reliability of the data collected. The same situation was 22.5% to 15.4% for rhinoconjunctivitis, 26.8% to 13.8% for eczema and 16.8 to 3.9% for rashes, and atopy prevalence of people chosen randomly was defined as 34.4% (9).

In 1991 and 1992, Kalyoncu et al. determined that Turkish asthmatics living in coastal regions were two times more pollen sensitive than those living in inner regions (10).

In 1992, Vermire et al. determined the current prevalence of asthma of Turkish immigrants as 5.8% for males and 14.5% for females. These values were higher than those of the native citizens of Belgium. In addition, the current prevalence of asthma among Turkish immigrants living in Belgium for more than 18 years was 15.11%, while it was 5.8% for those living there less than 18 years ($p < 0.001$) (11). In Turkish school-children in the 9-11 age group living in Germany, the prevalences of asthma (5.3%), atopy (24.7%) and bronchial hyper-reactivity (3.9%) were lower than those of their native counterparts. However, these rates were lower than those of subjects in the same age group in Turkey. Due to the acceptance criteria of the German government for immigrants, only children of healthy candidates had the chance to live in Germany, eliminating a group of high-risk children, which may be the reason for the statistical difference (12).

In a study on first-year students at Hacettepe University in 1994-1995, Kalyoncu et al. determined the periodic prevalence of wheezing and wheezing together with dyspnea to be 4.8% and 2.2%, respectively. In addition, the smoking rate was 5.5% and the average age of the students was 18.5 ± 2.1 (13). In 1994, research on 1820 adults revealed that the cumulative and current prevalence of wheezing in Ankara was 39.1% and 21.7%, respectively (14).

In Istanbul, in a study conducted by Erkan et al. in 1995, it was reported that the prevalence of wheezing was 6.8% and of awaking because of nocturnal dyspnea was 21.7% (15). In 1996, Özlü et al. (in a study on 1500 adults) found the periodic prevalence of wheezing to be 11.2%, wheezing without common cold 3.3%, dyspnea 11.1%, nocturnal coughing attacks 14.1%, asthma 2.2%, cured asthma cases 2.2% and rhinitis 26.7% in Trabzon (16).

In a study conducted in Kayseri, -a city central Turkey, Kart et al. determined the prevalence of asthma anemnesis to be 5.4% and asthma diagnosed by physical examination and respiratory function tests to be 2.9% in adults. Those rates were the same in both genders but increased with positive family history and high socio-economic status. The frequency of atopy was 3.5% in general. Together with asthma, rhinitis was the most common (29%) and eczema was the least common associated allergic disorder. The frequency of smoking was 32.2% in total (53.6% of males, and 18.4% of

females) and also for asthmatic subjects. This rate was lower than for the general population (17).

The current wheezing prevalence of students at Kocaeli University was found to be 22.7%. This parameter was 16.21% and the rate of having received an asthma diagnosis previously was 4.1% in housewives (1388 subjects) in Sivas (5). In a study conducted in Gaziantep, the prevalence of asthma was 2.1%, and atopy prevalence in asthmatic patients and non-asthmatic subjects was 46.7%, and 12.1% respectively. These rates increased with age after 30 and the peak was at 50 (6.4%). It was emphasized that only one fourth of asthmatic subjects who complained of acute and clear symptoms had been diagnosed previously (18).

In our study, the cumulative prevalence of asthma-like symptoms was 25.7%, whereas the periodic prevalence was 19.1%. The period prevalence of wheezing without a common cold was 12.4 and together with dyspnea was 15.6%. The cumulative and periodic prevalence of asthma-like symptoms observed in the female population was significantly higher than that of the male population. In the total population, the rates of sufferers from nocturnal attacks concerning compression of the chest, dyspnea, and coughing were 17.9%, 13.8% and 25.4%, respectively. These rates were significantly higher in female than in male populations. The rate of the female asthmatics that had been diagnosed previously was 3.5% whereas it was 2.6% in male asthmatics and 3.1% in the total population. All of these subjects were using anti-asthmatic drugs. Nearly one fourth of the female population and one fifth of the male population declared that they had some kind of allergies, and allergic rhinoconjunctivitis was the most common. In both sexes, children constituted the largest group among the allergic relatives of all subjects. It was observed that smoking increased both the cumulative and the periodic prevalence of asthma-like symptoms significantly in female subjects but not in male subjects or in the general population. We also clearly demonstrated that socio-economic status had no significant effect on cumulative and periodic prevalence of asthma-like symptoms. The cumulative and periodic prevalence of these symptoms in subjects with a positive history of allergic symptoms was significantly higher than in the others. For subjects having a cumulative and periodic prevalence of asthma-like symptoms, the rate of previously diagnosed asthma was much higher, at a significant level.

In our next study, we plan to examine the subjects with asthma-like symptoms found in this study by clinical inspection, and scanning by means of laboratory methods.

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