

The Prevalence of Asthma, Allergic Rhinitis and Eczema in North of Iran: the International Study of Asthma and Allergies in Childhood (ISAAC)

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Abstract

Objective: Asthma, allergic rhinitis and eczema as a common chronic disorder in childhood, has many epidemiologic variations in different geographic areas. Uniform and standard epidemiologic researches are able to clear and modify scientific questions in this field. We carried out this study to determine the prevalence and intensity of pediatric allergic disease in our region.

Material & Methods: This analytical-cross sectional study was performed on 2 groups of children; the first group aged 6-7 years (n=3240) and the second group aged 12-14 years (n=3254) during 2002-03. According to ISAAC programming, sample size consisted of 3000 children in each group. From all students 99.3% of primary students and 88.8% of guidance students entered into study. Data was gathered by ISAAC first phase questionnaire and analyzed by SPSS 10 and Chi square test.

Findings: The 12-month prevalence rates of symptoms were as follow: wheezing 16.8% and 21.7%, allergic rhinitis symptoms 14.5% and 19.9% and atopic dermatitis symptoms 4.5% and 8.2%, for younger and older age group, respectively. The prevalence of wheezing and current wheeze did not show differences according to sex ($P>0.05$) but it was significantly higher in students of guidance school ($P<0.05$). The prevalence of previous history of asthma, speech disorders, wheezing after physical exercises and dry cough at night, rhinoconjunctivitis, recurrent rhinitis, eczema with pruritus, recurrent lesions and history of eczema was significantly higher in boys and in students of guidance school ($P<0.05$). The prevalence of flexor lesion did not show a significant difference according to age ($P>0.05$) but in boys it was higher than in the girls ($P<0.05$).

Conclusion: According to our findings asthma, allergic rhinitis and eczema have a moderate prevalence in this region of our country.

Key Words: Asthma; Allergic Rhinitis; Eczema; ISAAC; Atopic Dermatitis; Students

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Introduction

Asthma, allergic rhinitis and eczema are the commonest chronic disease in childhood^[1]. In recent decades, the increasing prevalence of childhood asthma and atopy has been supported by studies including objectively measured asthma related parameters^[2-4]. This increase has been observed in different age groups in different populations over the past several decades^[5]. We observe many differences about asthma and its characteristics in various places in the whole world with various races. First step to explain and solve these ambiguities, is to have a clear knowledge about prevalence, intensity, severity and demographic characteristics in patients. When we use epidemiologic researches, especially when we use standard methods as in other parts of the world, we can solve all ambiguities and increase our knowledge in near future^[6]. The aim of this study was to determine the prevalence and severity of asthma, allergic rhinitis and eczema in two groups of children between 6-7 and 12-14 years of age by a unique and standard questionnaire.

Material & Methods

This study was a cross-sectional study which has been carried out on students in Babol (north of Iran) from September 2002 to February 2003. Our sample study had 2 groups: the first group consisted of children aged 6-7 years and in the second group were 12-14 year-old children. The exclusion criteria in this study were mentally retarded children and those visiting rural schools. Each school was a cluster. We selected randomly 59 elementary schools and 62 guidance schools.

Standard ISAAC core questions for wheezing, rhinitis, and eczema were used^[2]. From 6494 students, 5933 questionnaires were collected. The questionnaire return rate was 73.2% (6- to 7-year-old subjects) and 94% (13 to 14 year-old subjects). Finally, 3044 questionnaires (1632 for girls and 1412

for boys) from elementary schools and 2889 questionnaires (1509 for girls and 1380 for boys) from guidance schools were analyzed. Students from elementary school answered the questions with their parents and students from guidance school completed the answer sheet alone. Absent students were followed up. Data were analyzed with SPSS 10 and Chi Square test and odds ratio was calculated. P. value less than 0.05 was statistically significant.

Findings

The prevalence rates of asthma symptoms in children are shown in Table 1, The prevalence of wheezing and current wheeze did not show differences according to sex ($P>0.05$) but in students of guidance schools it was higher than in elementary schools ($P<0.05$). The prevalence of wheeze that could disturb child's sleep at night was not significant in the two age groups or sexes ($P>0.05$). The prevalence of speech disorders was higher in students of guidance school and in boys it was higher than in girls ($P<0.05$). The previous history of asthma was significantly higher in boys and it was more frequent in children aged 13 to 14 years ($P<0.05$).

The presence of wheezing after physical exercise and dry cough at night was more frequently reported by boys and children aged 13 to 14 years ($P<0.05$).

According to table 2, the prevalence of rhinitis was 15.7% in girls and 18.7% in boys; students of guidance schools were more susceptible to the symptom ($P<0.05$). The prevalence of recurrent rhinitis in boys was higher than in girls ($P<0.05$). The prevalence of this symptom was not different between guidance and elementary schools ($P>0.05$). The prevalence of rhinoconjunctivitis was 2.8% in elementary school students, 4.6% in guidance school students, 3.1% in girls and 4.3% in boys ($P<0.05$). Hay fever was more prevalent in boys than in girls ($P<0.05$).

According to table 3, the prevalence of eczema with pruritus and recurrent lesions

Table 1- Prevalence of asthma symptom in elementary and guidance school students according to age and sex in Babol, North of Iran.

Asthma symptom	Sex	Elementary	Guidance	Total	P-value	
					Age	Sex
Ever wheeze	Female	270 (16.5%)	312 (20.7%)	582 (18.5%)	0.000	0.2
	Male	242 (17.1%)	314 (22.8%)	556 (19.9%)		
	Total	512 (16.8%)	626 (21.7%)	1138 (19.2%)		
Current wheeze	Female	176 (10.8%)	190 (12.6%)	366 (11.7%)	0.001	1
	Male	138 (9.8%)	186 (13.5%)	324 (11.6%)		
	Total	314 (10.3%)	376 (13.0%)	690 (11.6%)		
Sleep disturbance related wheeze	Female	80 (4.9%)	62 (4.1%)	142 (4.5%)	0.5	0.5
	Male	59 (4.2%)	57 (4.1%)	116 (4.2%)		
	Total	139 (4.6%)	119 (4.1%)	258 (4.3%)		
Speech disorder	Female	57 (3.5%)	62 (4.1%)	119 (3.8%)	0.041	0.026
	Male	59 (4.2%)	80 (5.8%)	139 (5.0%)		
	Total	116 (3.8%)	142 (4.9%)	258 (4.3%)		
Ever asthma	Female	35 (2.1%)	43 (2.8%)	78 (2.5%)	0.004	0.000
	Male	56 (4.0%)	85 (6.2%)	141 (5.1%)		
	Total	91 (3.0%)	128 (4.4%)	219 (3.7%)		
Exercise-related wheeze	Female	45 (2.8%)	86 (5.7%)	131 (4.2%)	0.000	0.000
	Male	35 (2.5%)	180 (13.0%)	215 (7.7%)		
	Total	80 (2.6%)	266 (9.2%)	346 (5.8%)		
Dry cough at night	Female	224 (13.7%)	321 (21.3%)	545 (17.4%)	<0.001	0.049
	Male	156 (11.0%)	275 (19.9%)	431 (15.4%)		
	Total	380 (12.5%)	596 (20.6%)	976 (16.5%)		

was significantly higher in boys and in students of guidance schools ($P < 0.05$). The prevalence of flexor lesion did not show significant difference according to the age ($P > 0.05$) but it was in boys higher than in girls ($P < 0.05$). The prevalence of history of eczema in guidance schools was significantly higher than in elementary schools and in boys it was higher than in girls ($P < 0.05$).

Discussion

In our study, the 12 month-period prevalence of wheezing in school-age children was 19.2%;

so nearly one fifth of our children had wheezing. In our study, the prevalence rates of asthma symptoms in both age groups are higher than in the similar other studies in Croatia and Thailand^[7,8]. The global ISAAC Phase One Asthma Report demonstrated large worldwide variations in the prevalence of asthma symptoms among 156 collaborating centers in 56 countries with a total of 721,601 participating children. There were more variations in prevalence of asthma symptoms between countries than within countries^[9]. The highest asthma prevalence rates were recorded in United Kingdom, New Zealand, and Australia followed by the countries in North America. The lowest asthma prevalence

Table 2- Prevalence of allergic rhinitis symptom in elementary and guidance school students according to age and sex in Babol, North of Iran

Rhinitis symptom	Sex	Elementary	Guidance	Total	P-value	
					Age	Sex
History of rhinitis symptom	Female	236 (14.5%)	257 (17.0%)	493 (15.7%)	<0.001	0.002
	Male	204 (14.4%)	318 (23.0%)	522 (18.7%)		
	Total	440 (14.5%)	575 (19.9%)	1015 (17.1%)		
Current rhinitis symptom	Female	164 (10.0%)	132 (8.7%)	296 (9.4%)	1	0.029
	Male	148 (10.5%)	164 (11.9%)	312 (11.2%)		
	Total	312 (10.2%)	296 (10.2%)	608 (10.2%)		
Rhinoconjunctivitis	Female	50 (3.1%)	47 (3.1%)	97 (3.1%)	<0.001	0.013
	Male	36 (2.5%)	85 (6.2%)	121 (4.3%)		
	Total	86 (2.8%)	132 (4.6%)	218 (3.7%)		
Limitation activities	Female	1 (0.1%)	181 (12.0%)	182 (5.8%)	0.8	0.2
	Male	185 (13.1%)	0	185 (6.6%)		
	Total	186 (6.1%)	181 (6.3%)	367 (6.2%)		
Hay fever	Female	80 (4.9%)	103 (6.8%)	183 (5.8%)	<0.001	<0.001
	Male	84 (5.9%)	162 (11.7%)	246 (8.8%)		
	Total	164 (5.4%)	265 (9.2%)	429 (7.2%)		

rates were reported from several eastern European countries, China, and some other countries in Southeast Asia. Generally, asthma was less prevalent in developing countries than in more affluent countries^[10]. In our study, “12-month wheezing” was more prevalent in the younger than in the older age group. It is probably a consequence of the fact that many young children suffer from wheezy bronchitis which occurs during the winter months in response to viral infections, and in most cases it resolves relatively rapidly during early school age^[11]. In our study, like in other ISAAC participating centers^[12], “wheezing ever in life” showed the highest prevalence in comparison to all other variables regardless of age, suggesting that responses to this question were related not only to asthma but also to other conditions associated with wheezing.

In this study, the prevalence rate of rhinitis symptoms in both age groups is higher than children in Croatia^[7] and city of Zagreb^[12] and lower than in children in Thailand^[8]. Wide variations in the prevalence of rhinitis were

observed across centers with a higher prevalence in Austria, Madrid, Cartagena and Bilbao, lower prevalences were reported from Barcelona, Castellon and Pamplona^[13]. The results obtained in our study showed even higher 12-month and lifetime prevalence rates of allergic nasal symptoms and hay fever, particularly in the older age group. The global ISAAC Phase One study reported a more than fourfold worldwide variation in the prevalence of allergic nasal symptoms in both age groups^[14]. However, we believe that 12-month prevalence of nasal symptoms (not the combination of nasal symptoms great majority of children living in the our region are sensitized to house dust mite it may be expected that many of them have perennial allergic rhinitis without associated significant conjunctival symptoms^[15]).

Our results for reported eczema symptoms in both age groups are higher than previously reported study in former socialist Europe and lower than that in Scandinavia and the United Kingdom^[16].

Table 3- Prevalence of eczema symptom in elementary and guidance school students according to age and sex in Babol, North of Iran

Rhinitis symptom	Sex	Elementary	Guidance	Total	P-value	
					Age	Sex
History of rash	Female	78 (4.8%)	73 (4.8%)	151 (4.8%)	<0.001	<0.001
	Male	59 (4.2%)	164 (11.9%)	223 (8.0%)		
	Total	137 (4.5%)	237 (8.2%)	374 (6.3%)		
Current rash	Female	52 (3.2%)	33 (2.2%)	85 (2.7%)	0.028	0.001
	Male	38 (2.7%)	83 (6.0%)	121 (4.3%)		
	Total	90 (3.0%)	116 (4.0%)	206 (3.5%)		
Lesion in flexor	Female	31 (1.9%)	15 (1.0%)	46 (1.5%)	0.06	0.000
	Male	23 (1.6%)	57 (4.1%)	80 (2.9%)		
	Total	54 (1.8%)	72 (2.5%)	126 (2.1%)		
Sleep disorder	Female	58 (3.6%)	29 (1.9%)	87 (2.8%)	0.4	0.001
	Male	42 (3.0%)	78 (5.7%)	120 (4.3%)		
	Total	100 (3.3%)	107 (3.7%)	207 (3.5%)		
Cured rash	Female	33 (2.0%)	17 (1.1%)	50 (1.6%)	0.7	0.6
	Male	21 (1.5%)	30 (2.2%)	50 (1.8%)		
	Total	54 (1.8%)	47 (1.6%)	100 (1.7%)		
History of czema	Female	39 (2.4%)	43 (2.8%)	82 (2.6%)	<0.001	<0.001
	Male	37 (2.6%)	149 (10.8%)	186 (6.7%)		
	Total	76 (2.5%)	192 (6.6%)	268 (4.5%)		

In our study the prevalence of asthma, rhinitis, and eczema symptoms (except dry cough at night) in boys were higher than in girls. Previous studies show a higher incidence of atopy in boys compared with that in girls because of higher prevalence of atopy in boys^[13,17].

Conclusion

Our study provides an up-to-date description of the scale and distribution of asthma, rhinitis, and eczema in children from the center of Mazandaran province. The study would be a suitable baseline for monitoring future trends in the prevalence and severity of asthma among these children. Results show that asthma, allergic rhinitis and eczema have

a moderate prevalence in this region of our country.

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