

The Prevalence of Symptoms of Asthma and Allergic Diseases through ISSAC Method in Teenagers

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Article information	Abstract
<p>Article history: Received: 17 Jan 2011 Accepted: 15 Feb 2011 Available online: 27 July 2011</p> <p>Keywords: Asthma Rhinitis Allergic Diseases Eczema Child</p> <p>*Corresponding author at: Department of Epidemiology, Faculty of Health, Qom University of Medical Sciences, Qom, Iran. E-mail: beigi60@gmail.com</p>	<p>Background: Asthma is the most important chronic disease in children and one of the causes of school absenteeism, which is getting more prevalent by the increase of environmental pollutants and industrial life. This study was planned and performed to estimate the prevalence of asthma and other allergic diseases.</p> <p>Materials and Methods: This cross-sectional study was conducted in 2009 on 3000 female and male students of first grade of guidance school, who were selected by multistage sampling. Data were collected by standard questionnaire and after data collection and entering ISSAC SPSS software the prevalence of asthma and allergic diseases was estimated. Statistical analysis was performed using χ^2 statistical test at significance level of 0.05.</p> <p>Results: Prevalence of asthma, hives, eczema and atopic disease was respectively 3.8 percent, 10.4%, 18.3% and 42%. Prevalence of hives, eczema, atopic disease, watery eyes and wheezing after exercise in both genders showed a statistically significant difference ($p < 0.05$), but asthma, hay fever, speaking difficulty, runny nose and dry cough in both genders had no significant difference ($p > 0.05$).</p> <p>Conclusion: The results of this study indicated that although the prevalence of asthma in Shirazi children is less than some other cities, the increased development of disease in recent years will be a threatening risk and this phenomenon requires serious attention and planning by authorities as well as health policymakers.</p> <p>Copyright © 2012 Zahedan University of Medical Sciences. All rights reserved.</p>

Introduction

Asthma is one of the most important chronic diseases in school children and one of the causes of school absenteeism, which is considered as one of the growth problems [1]. Asthma is the inflammatory response of airways in which normal breathing is disturbed due to obstruction of airways into lungs [1]. The specific symptoms of asthma include recurrent wheezing, gasping, chest tightness and pain and coughing which usually increase in contact with some factors such as dust, activity, smoking and air pollution [2]. Over the past three to four decades in England, the incidence and prevalence of asthma has increased, so that it has affected all age groups [2]. There are some disagreements on the increase of prevalence of the disease, so that some studies in the 1990s have shown the increase of disease, while it has been reported stable or even declining in some areas [3]. Several studies conducted in 56 countries of the world with different languages, races and ethnicities indicate the extensive prevalence of asthma in different parts of the world, so that prevalence of wheezing varies from 2.5% in Indonesia and 32.2% in Britain [2]. Also according to the conducted studies, lifetime prevalence of asthma and wheezing varies from 9.8 to 15.1% [4,5]. The studies conducted in Iran also show the prevalence of asthma in

children from 3.9% in Isfahan [6], 11.9% in Sanandaj [7], 15.4% in Rasht [8], 26% in Qazvin [9] and 28.7% in Kashan [10]. Also, in another study the prevalence of asthma in Iran was reported from 2.7% in Kerman to 35.4% in Tehran [11]. Nevertheless, two recent meta-analysis studies were reported the prevalence of asthma in Iranian elementary and guidance school age children 3.9% and 4.4%, respectively [12,13]. Rhinitis is one of the major disorders of childhood [14] and the prevalence of symptoms associated with rhinitis is also widely various, so that runny nose in the absence of cold varies from 1.5 to 41.8% during a year and symptoms associated with watery eyes varies from 0.8 to 14.9% in school children. Based on the results of different studies, the prevalence of asthma and rhinitis are correlated, so that in areas with high prevalence of asthma (more than 30%) such as Australia, Netherlands and England rhinitis is highly prevalent and the opposite is also true [15]. Atopic eczema is also much more prevalent (more than 60 times) and varies from 0.3 to 20.5%. The highest prevalence (over 15%) has been observed in urban centers of Africa, Australia, North and West Europe and the lowest prevalence (less than 5%) have been reported in China, Central Asia and Eastern Europe [15,16]. Because of the

increasing prevalence of asthma and other allergic diseases [17] and compliance of people with industrial life in developing countries [6], prevalence of the mentioned diseases in larger cities is more than other cities [15]. Thus, given that so far no study has been conducted in Shiraz as one of the major cities of Iran on the estimation of the prevalence of asthma and other allergic diseases according to the recommendation of International Study of Asthma and Allergies in Childhood (ISAAC), the present study was designed and conducted with the same goal.

Materials and Methods

This cross-sectional study was conducted during the academic year 2009-2010 on 3000 students of first grade guidance school. Sampling was performed based on the recommendation of the International Study of Asthma and Allergy in Childhood (ISAAC) and the global prevalence of this disease equal to 3% and considering 95% confidence interval and estimation accuracy of one percent using formula for determining sample size for prevalence studies, was determined 1200 subjects in each gender and given cluster sampling in the study and considering the coefficient 1.3 for acceptable accuracy of the plan, ultimately total 1500 and 3000 people in each group were included into the study and each school was considered as a cluster. Sampling of participants was based on multistage sampling, so that in the first stage, proportional stratified sampling was performed and each Educational district was considered as a class and the share of each district was determined proportional to the number of schools in each district and in the second stage, considering each school as a cluster, in each region the number of the required schools was selected by systematic sampling method. Then, all selected students of first grade guidance schools were included in the study. In the next stage, we went to the selected class and after justifying the study goals to students by the researcher and the project colleague, the questionnaire was distributed among all students.

The questionnaire used in this study is a standard tool which has been used in the international study of asthma and allergies in children. The applied questionnaire was the questionnaire of International Study of Asthma and Allergy in Childhood and includes variables such as gender, presence of wheezing, history of wheezing during the past 12 months, the number of potential relapses during the past 12 months, presence of asthma, runny nose and eyes, and its history during the past 12 months, wheezing after exercise, overnight dry coughs in the last 12 months, disturbance of daily performance, hay fever, hives, history of hives during the past 12 months, the area involved in hives, itching in sleep and eczema.

Self-administered ISAAC questionnaire is the most common method widely used to determine the prevalence and severity of symptoms of asthma and allergic diseases, due to its ease of use and low cost without need for a trained questioner. Although not mandatory, but it is recommended that the target community in this tool

should be school-aged children in the age group of 13 to 14 and 6 to 7 years old [16]. In this study, if any student was not willing to participate in the study, they would be excluded at their request. After collecting the completed questionnaires from the schools, the data were encoded and inserted into the SPSS-13 statistical software and was analyzed using ² statistical testing at significance level of 0.05.

Results

The prevalence of asthma, hives, eczema and atopic diseases in school children participating in the study was respectively estimated (CI 95%: 0.12-4.48) 3.8%, (CI 95%: 9.31-11.49) 10.4%, (CI 95%: 16.92-19.68) 18.3% and (CI 95%: 40.23-43.77) 42%. In addition, the prevalence of wheezing after exercise was calculated 14% in the studied participants. 578 people (19.3%) of participants have dry coughs and 75 people (2.5%) have speaking disorder.

Table 1 shows the prevalence of asthma and other allergic diseases in both males and females and based on the results presented in this table the prevalence of hives, eczema and atopic disease is statistically significant different in both genders ($p < 0.05$), so that except atopic diseases, other mentioned diseases are more in girls than boys. The results showed that the prevalence of asthma and hay fever was not significantly different between the two genders ($p > 0.05$).

Table 1. Prevalence of asthma and other allergic diseases and its relationship with gender

Diseases	Boy (Number)	Girl (Number)	p-Value
Asthma	51(3.4%)	64(4.3%)	0.216
Hives	200(13.3%)	111(7.4%)	<0.001
Eczema	408(27.2%)	141(9.4%)	<0.001
Atopic disease	481(32.1%)	780(52%)	<0.001
Hay Fever	40(2.7%)	29(1.9%)	0.180

Table 2 shows the prevalence of disorders and symptoms of asthma and other allergic diseases, suggesting that watery eyes and wheezing after exercise is significantly different in the two genders ($p < 0.05$). So that wheezing after exercise in boys is more than girls, and runny eyes is more in girls than boys. In addition, the results showed there is no significant difference between the symptoms of runny nose and dry cough in the two genders ($p > 0.05$).

Table 2. Prevalence of some disorders and consequences associated with asthma and allergic diseases and its relationship with gender

Disorders	Girl (Number)	Boy (Number)	p-Value
Speaking restrictions	34(2.3%)	41(2.7%)	0.413
Watery eyes	196(13.1%)	151(10.1%)	0.010
Runny nose	481(32.1%)	499(33.3%)	0.483
Wheezing after exercise	150(10%)	271(18.1%)	0.001
Dry cough	278(18.5%)	300(20%)	0.308

Discussion

The present study was conducted based on the first phase of ISAAC plan and total prevalence of asthma in 13 to 14 year old children in Shiraz was estimated 3.8%. Although the prevalence of other allergic disorders in this study was obtained over two to ten times as much as asthma, according to the results of another study conducted by Ayatollahi and Qaem [18], the prevalence of definite asthma was calculated 1.2%. Thus, it seems that the prevalence of disease has been increasing in children, so it has been tripled within 5 years.

Lifestyle changes and use of a variety of fast foods, especially among teenagers which has a growing trend in our society, can be among the causes of increase of prevalence of disease. However, the data collection should be also noted in this study and since the tools and methods of detection of these two studies have been different, it may not be ineffective.

In this regard, the results of another study at global level revealed that prevalence of disease is increasing in most Asian, Latin American as well as African countries, while the prevalence of this disease is decreasing in English-speaking countries that previously had a higher prevalence [19]. Although the increase of disease can be attributed to the improvement of parental knowledge and awareness for treatment and enhancement of diagnostic facilities, the increased contact with allergens, promotion of junk food consumption with allergen colors, and increased contact with tobacco and environmental pollutants are also of influential factors [15].

In the present study, there is no significant difference between wheezing after exercise in the two genders, so that the prevalence of this complication was more in girls than boys, and this result was also observed in the study of Hatami in Bushehr [20]. However, in another study, no significant difference was observed between the two genders [21]. Also there was a significant difference between the two genders in terms of hives and eczema, and hives and eczema had been estimated to be more in girls than boys. Similar results were also obtained in the study of Yan et al [22] mentioned the cause of such a difference in the mentioned study to be more tendency of girls than boys towards the diagnosis of the disease. Also, several studies have demonstrated an association between the prevalence of asthma and other allergic diseases [3,23]. Accordingly, it can be concluded that factors associated with lifestyle changes and environmental changes will not be ineffective [15].

The severity of asthma symptoms in the questionnaire used in the study will be determined with three questions about the number of relapses, nocturnal waking and speaking restrictions. In our study, the prevalence of severe forms of disease (more than 12 relapses) was present in 7% of patients with wheezing. Such questions in the questionnaire reduces the probability of recall error or forgetfulness resulting from wheezing attack or the effect of some factors such as season [24] and leads to more accurate estimation of prevalence of symptoms. It should be noted that the increase of parental awareness as

well as increased environmental pollutants and other allergens in the natural environment of living affect in two totally different ways on the disease process. Increase of parental awareness reduces wheezing within one year and causes children to refer for treatment faster and thus the number of attacks will be reduced, but environmental pollutants and allergens increase the disease relapse phase. Wheezing during activity or exercise is also one of the nonspecific symptoms of asthma, which showed a significant difference between the genders in this study. The higher incidence of this complication in boys could be due to the intensity of their more physical activity and mobility than girls. The results of another study in Babol also indicate this point [21]. Prevalence of allergic rhinitis in the present study was also estimated 32.7%. In this study, it was estimated 19.9% in Babol [21], 42.7% in Yazd [25], and 25.5% in Bushehr [20]. Thus, it seems that prevalence of allergic rhinitis is higher compared with other cities, yet less than Yazd. According to the two consecutive reports of ISAAC Steering Committee, the prevalence of asthma in Iranian children aged 13 to 14, in 1998 and 2004 was respectively 10.9% and 13.2%, which shows that the absolute increase of prevalence over a period of six years has been over 2.3% and its annual increase has been 0.17%, while the average increase in the prevalence of asthma symptoms throughout the world has been 0.13% in children aged 13 to 14 during 1998 to 2004 [26,27], suggesting that rapid increase of the disease in Iran is higher than its global trend.

Also based on the meta-analysis study conducted in Iran in 2003, the prevalence of asthma in children under 18 has been about 13.14%, which is consistent with the results of ISSAC [28]. However, it should be noted that based on the increasing trend of the disease until 2014, if life pattern in the country will not change, the prevalence of asthma symptoms in the country will overpass 15% as well. Also, given the increasing trend of the disease in Shiraz and throughout the country, it is recommended that further studies should be conducted on determination of prevalence of asthma in the country and considering the differences of prevalence in different regions, the inequalities generated in this regard should be discussed. It should be noted that estimation of international organizations of the prevalence of asthma in the country is also much less than its actual amount and it seems that Iran's share of total asthma in the world and the region is higher than the average global and regional rate.

The results showed that the prevalence of asthma in children of guidance school in Shiraz is at an average level, and although the disease prevalence in Shiraz children is less than some other cities, it has been rapidly growing compared with previous studies, so that it can be considered a threatening risk within the next years. Therefore, this phenomenon requires more serious attention and planning of authorities as well as health policymakers.

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