

The Prevalence of Asthma among the Students (7-18 Years Old) in Tehran during 2002-2003

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ABSTRACT

Asthma is one of the most common problems of childhood, responsible for a significant proportion of abstinence from school because of chronic illness.

This study was carried out among the school-aged children (7-18 years) in Tehran schools during 2002-2003, in order to determine the frequency of asthma.

According to the recommendation of WHO (World Health Organization), we designed a questionnaire, containing 8 standard questions, and the students were given necessary information to complete the questionnaires. The pre-high and high schools students completed the questionnaires but the parents of primary school students completed them on their behalf.

The prevalence of asthma was 35.4% in Tehran; this prevalence was higher in the boys (37.1%), as compared to the girls (33.5%). The prevalence of this disease has been estimated about 39.5% in pre-high schools, 35.4% in high schools and 31.6% in primary students. Based on this survey, the most common clinical manifestations of asthma were: prolonged cough lasting more than 10 days (22.4%), and exercise-induced wheezing or dyspnea (16.9%), followed by repeated dyspnea or wheezing (6.4%).

The prevalence of asthma is high among the students of Tehran schools and it needs more careful screening programs along with additional information to the patients and parents about the disease.

Keywords: Asthma, Children, Prevalence, Epidemiology, Iran

INTRODUCTION

Asthma is a chronic inflammatory airway disease that is responsible for a significant proportion of school lost days because of chronic illness.^{1,2}

Wide variations in the prevalence of asthma have been reported between different countries. The prevalence of asthma varies from few cases to 30%.²

However, recent reports from various countries have revealed significant worldwide increases in the prevalence of asthma and other allergic diseases.³⁻⁶

A recent, collaborative effort to simultaneously study worldwide prevalence of childhood asthma utilizing a standardized questionnaire (the ISAAC I, International Study of Asthma and Allergy in Children, phase I) reported a wide variation of prevalence of childhood asthma ranging between 3 to 30%.⁷ Data from Asia and developing countries are, however, not as widely available. Such data are necessary, not only for epidemiological purposes, but also for determining the pharmacoeconomic extent of

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asthma to each society. Tehran, the capital of Iran, is the first most crowded city in the country. The climate is characteristically dry, with hot temperatures in summer and a snowy winter. Despite a wide availability of epidemiological data on childhood asthma in different countries, prevalence of such disorder has not been fully studied in our country.

The availability of such data across geographic regions is important since it enables investigators to gather insights regarding risk factors for these conditions among different populations. The objective of this study was to study the prevalence of asthma-related symptoms among school children in Tehran utilizing standardized ISAAC phase I epidemiological measures.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted during 2002-2003. The study groups were systematic randomly chosen from school-aged children of Tehran schools. A questionnaire was distributed to 2000 children, aged 7-18 years.

In order to execute the scheme according to the recommendation of World Health Organization (WHO), a questionnaire containing 8 key questions were designed based on the manifestations of the Asthma. The supposition on the disease was defined as answering "yes" to even one of the questions.

It indicated that giving positive answer to one question was considered as being a patient.

The Education and Training Ministry of Iran was informed about the procedure of the plan. Based on their classifications, the schools of the north, east, west and south of Tehran were specified. In each area some schools (primary, pre-high and high school) were selected randomly and each school was considered as a cluster. Pre-high schools in Iran consist of 3 years general education and 11-13 years old children attend these schools.

After providing necessary justifications, some

zones (from 20 zones of Tehran) were selected randomly maintaining however an equal ratio of the primary, pre-high and high schools and the number of people based on sex (the proportion of girls to boys was equal).

After explanation, the students were given the questionnaires containing 8 questions.

In the primary schools the questionnaires were completed by the parents and in the other stages, the students completed the questionnaires by themselves with their parents' help.

RESULTS

In this study, a total number of 2000 cases were included. We estimated that the prevalence of asthma in the Tehran school was 32.9% in the north, 34.9% in the east, 32.2 in the west, and 41.6% in the south of Tehran (mean 35.4%).

The prevalence of asthma is 37.1% in males and 33.5% in females (Table 1), which is statistically significant ($p=0.04$). The male to female ratio was 1/2 to 1.

The prevalence of disease were 36.1% in primary schools, 39.5% in pre-high schools, and 35.4% in high schools (Table 2), which show a significant higher prevalence in pre-high schools ($p=0.0009$).

The most common manifestations of asthma were prolonged cough (22.4%), exercise-induced cough and wheezing (Figure 1).

According to the high correlation between asthma and wheezing (sensitivity: 65 to 91%, and specificity: 85 to 96%), the frequency of positive answer to this question was 5.8% in primary schools, 6.2% in pre-high schools, and 6.7% in high schools (female to male ratio 1.5).

Wheezing or dyspnea (induced by irritant exposure) had a frequency of 18.5% in high schools, 13/2% in pre-high schools, and 9/2% in primary schools, which implies a significant higher rate in high schools ($p=0.0006$).

Table 1. The prevalence of asthma, according to sex in Tehran.

Sex	Population	Asthmatic children	
		Number	Percent
Male	1020	379	37.1
Female	1020	343	33.3
Total	2040	722	35.2

Table 2. The prevalence of asthma, according to educational grades in Tehran.

Educational section	Population	Asthmatic children	
		Number	Percent
Elementary schools	680	215	31.3
Pre-high schools	680	269	39.5
High schools	680	238	35
Total	2040	722	35.2

The prevalence of prolonged cough (lasting more than 10 days) was 29% in primary schools, 26.7% in pre-high schools, and 18.5% in high schools, which indicates higher rate in primary-school ages ($p=0.002$).

Based on the drug responses after receiving Salbutamol, the prevalence of asthma was evaluated in the range of 32.2% in primary schools, 16.7% in pre-high schools and 22.9% in high schools, which demonstrated a significantly higher rate in primary schools ($p=0.0001$).

DISCUSSION

The prevalence of childhood asthma has increased substantially over the past 30 years.^{8,9} Our results demonstrated that the prevalence of asthma among the children, 7-18 years of age, in Tehran schools was

35.4%, which suggests a considerable increasing rate in Iran.¹⁰⁻¹²

However, the prevalence of the true cases of asthma seems to be less than the estimated prevalence based on the questionnaires. According to a survey, carried out in the city of Kashan during 1998, the prevalence of wheezing was 24.4% (in 12 to 14 years-old children) and 22.2% (in 6 to 7 years-old children), while the diagnosis by the physician had been reported to be 1.75% (in 12 to 14 years-old children) and 7% (in 6 to 7 years-old children).¹⁰

In a previous study in Tehran (1995), the prevalence of wheezing was 10.8% for the children aged 6-7 years and 22.3% for the children aged 13-14 years-old. In this study the prevalence of definite cases of disease was about 1.7% (in 6 to 7 years-old children) and 2.6% (in 13 to 14 years-old children).¹¹

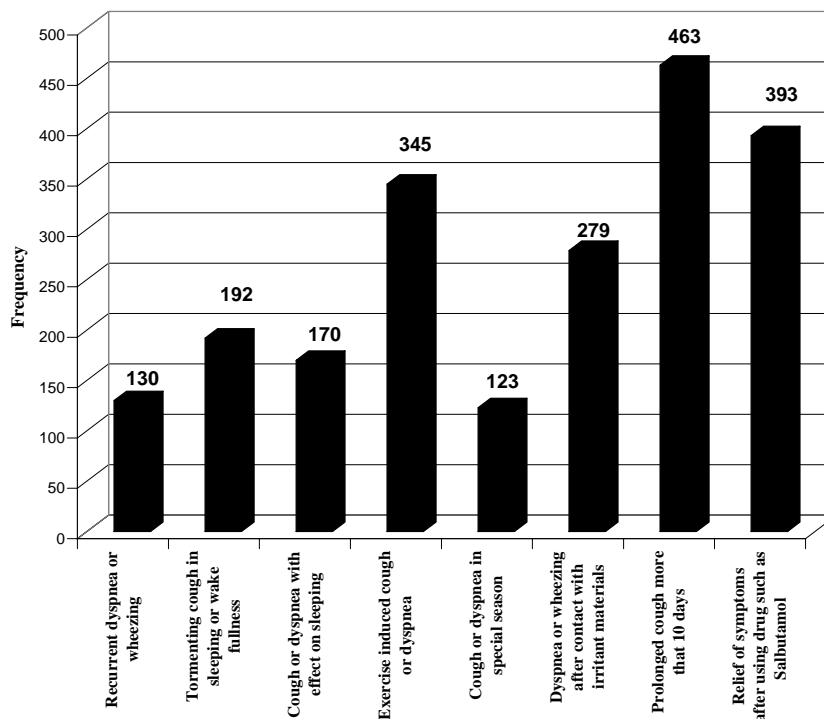


Figure 1. The prevalence of asthmatic symptoms in school children in city of Tehran.

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In our study the boys had a higher prevalence of asthma, compared to girls (1/2 to 1), which is congruent with other studies. In the study of Kashan (1998-1999), the prevalence of wheezing during last 12 months was 6.7% in girls and 13.1% in boys of the first grade of primary schools, and 12.3% in girls and 16.6% in boys of pre-high schools.¹⁰

In the previous study in Tehran (1995), the prevalence of asthma was higher in pre-high schools,¹¹ similar to our study. This study clarified that the proportion of the disease prevalence was 1/6 to 1 in pre-high-school students to the younger students.¹¹

Another study carried out in the town of Birjand (1996), showed that the prevalence of wheezing was 12.3% in pre-high schools and 8.1% in primary schools, and the ratio of older children to primary schools children was 1/9 to 1.¹²

The most common manifestations of asthma consisted of: prolonged cough (lasting more than 10 days), which is significantly more frequent in primary schools versus other schools and followed by the high frequency of respiratory infections in these ages.

Wheezing and exercise-induced dyspnea and also wheezing and coughing after irritant-exposure represent a significant high ratio in older ages because of high allergic incidences in these ages. It is possible that the exercise-induced dyspnea would be caused by the other stimulants, which can be as a confounding factor in the results of the study. The most important point in our study is the high frequency of asthma in the schools of Tehran, which needs more attention in history taking by the physicians and the necessity of giving information to the people by the means of all communication and educational media. Moreover establishing the educational classes in Tehran based

on the useful data and information about the asthma is also suggested.

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