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Prevalence of Asthma and Related Symptoms in School-Aged Children in Zarinshahr, IRAN

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ABSTRACT

Background: *Information on the magnitude of the problem of childhood asthma in rural areas of Iran and the factors influencing its occurrence is inadequate. This study was carried out to measure the prevalence of asthma among school-aged children in Zarinshahr and factors, which determine its occurrence.*

Materials and Methods: *A questionnaire-based study carried out in 33 randomly selected school classes in Zarinshahr. The age of participants ranged from 6 to 13 years.*

Results: *Overall, 1309 questionnaires were returned. The prevalence rates of asthma diagnosed previously, asthma ever in life, current asthma, nocturnal symptoms and exercise induced cough were1.2%, 14.7%, 5.9%, 11.3%, and 19.4%, respectively. Allergic rhinitis and allergic chronic cough were presented in 1.9% and 2.4% of the children.*

Conclusion: *A positive family history of similar disorder, early childhood respiratory infection, paternal smoking and keeping cats at home were significant factors influencing the development of asthma, while children's gender and parental education did not.* ***(Tanaffos 2002; 1(2): 41-46)***

Keywords: *Asthma, School-aged children, Prevalence, Risk factor.*

INTRODUCTION

One hundred years ago, William Osler said "Asthmatic patients pantingly find their way to senility and pass away " (1). This optimistic view signed to the benign nature of asthma; however, recent decades' reports show that the mortality rate of asthma increased in the second half of the 20th century (2,3,4,5). Asthma mortality is limited to uncontrolled and refractory cases (6). Considering asthmatic patient's and their family's sufferings, the need for more investigation about disease prevalence is appeared. Recent 20-year reports show an increase in prevalence of asthma in developed as well as developing countries (7,8,9,10,11). Since this increase is mainly due to slight forms of disease (12), some clinicians believed that emerging more accurate diagnostic means such as spirometry along with increase in physicians' attention toward asthma, result in detection of slight and subclinical forms of disease (13).Most of researchers believe that the increase in prevalence of asthma is actual and due to increase in air pollutants. (14,15,16,17). Some theories recognize the effect of reduced microbial infections in increment of asthma prevalence (18).

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Whichever of the aforementioned theories would be correct, we need epidemiological indices in order to evaluate future changes as well as design preventive program. In addition to industrial pollutants, Biomass fuels[1] are another sources of environmental pollution in developing countries (19). These kinds of fuels are used indoor; thereby, women and children are more affected because of more exposure (20,21).

In the large cities of Iran such as Isfahan, biomass fuels have been replaced by gas and petroleum, which have less toxic effects than other biological fuels (22). However, increase in industrial pollutants has superseded indoor pollutant decreased. In these large cities, elderly have been exposed not only to indoor pollutants in their youth period but also to industrial pollutants when they were old(23), it leads to increase respiratory disease in this age-group.

Although discrimination between respiratory effects of industrial pollutants and indoor pollutants seems difficult, this study was designed in order to evaluate the pollutant effects of traditional life style on the prevalence of respiratory disease.

This study was performed in Zarinshahr, a small town situated in southwestern region of Isfahan province. Style of living in this town is a sample of traditional Iranian urbanity. Pollutant industries are not still current, and ancient customs such as indoor bakeries are still prevalent.

The aim of this study was to evaluate the prevalence of asthma among school-aged children in Zarinshahr.

MATERIALS AND METHODS

A total of 1427 children were selected from 33 classes (16 for boys and 17 for girls) among all of the primary schools in Zarinshahr. Sample estimation was based on relative incidence rate of childhood asthma in Iran (7-8%) (24,25). The children were selected through proportional random cluster sampling.The ISSAC (International Study of Asthma and Allergies in Childhood) questionnaire was used. Some questions were changed according to socio-cultural differences. The method was described later (26,27).

DEFINITION OF TERMS:

- **Asthma diagnosed ever**: a physician has clearly told parents that their child had asthma.
- **Upper airway hypersensitivity diagnosed ever**: recurrent episodes of sneezing, nasal discharge or nasal congestion.
- **Lower airway hypersensitivity diagnosed ever**: recurrent episodes of cough, sputum, and respiratory tract irritation.
- **Asthma ever**: history of paroxysmal dyspnea with wheezing lifetime.
- **Current Asthma**: history of at least one episode of paroxysmal dyspnea with wheezing in the last 12 months.
- **Nocturnal complaints**: recurrent episodes of night-awake because of chest tightness and cough with or without wheezing.
- **Exercise-induced complaints**: exercise interruption due to severe cough and chest tightness.

We made a comparison between age and sex using chi-square test. We also did a multivariant analysis of risk factors priority by using multiple regression.

RESULTS

Of 1427 questionnaires, 1309 (91.7%) were returned. Prevalence of asthma and related symptoms are shown in Table1. Demographic characteristics of the participants were presented in Table 2.

[1]Biomass fuels: biological fuels include oil, coal, compost, and wood.

Table 1. The prevalence of asthma and related symptoms, Zarinshar

	Male (%)	Female (%)	P-value	OR (CI)*
History of diagnosed asthma	9(1.5)	12(1.7)	NS*	_____
History of upper respiratory tract hypersensitivity	9(1.5)	16(2.2)	NS	_____
History of lower respiratory tract hypersensitivity	14(2.3)	17(2.4)	NS	_____
Asthma attack life time	77(12.9)	116(16.3)	0.05	1.3 (1-1.79)
Active asthma during past 12 months	27(4.5)	50(7)	0.036	1.2(1.06-1.4)
Nocturnal complaints	60(10.1)	88(12.3)	NS	_____
Exercise induced asthma	93(15.6)	161(22.6)	0.001	1.2(1.1-1.35)

*OR = Odds Ratio * NS= Not Significant

*CI = Confidence Interval

Table 2. Age distribution of children by gender*.

Age (years)	Male (%)	Female (%)	Total (%)
<7	11(2)	5(0.9)	16(1.5)
7	69(12.8)	110(19.7)	179(16.3)
8	84(15.5)	106(19)	190(17.3)
9	132(24.4)	88(15.8)	220(20)
10	131(24.2)	116(20.8)	247(22.5)
11	70(12.9)	104(18.6)	174(15.8)
12	40(7.4)	28(5)	68(6.2)
≥13	4(0.8)	1(0.1)	5(0.5)

*210 cases did not mentioned their age.

Correlation between asthma-ever as well as current asthma with risk factors is indicated in Table 3.

Table 3. Correlation between pulmonary asthma and active asthma and some important risk factors*.

	P-value	
Variable	Asthma ever	Current asthma
Age	0.005	NS
Gender	NS	NS
Parent's education	NS	NS
Paternal smoking	NS	0.003
Maternal smoking	NS	NS
The number of households	NS	NS
History of early childhood respiratory infection	0.007	0.003
Similar disease of parents	0.05	0.05
Similar disease of siblings	0.041	0.022
Keeping cats at home	0.003	0.01

* Correlation between asthma and fuel could not be analyzed because most of participants used different sorts of fuels.

Among parents, 220 fathers (16.8%) and 12 mothers (0.9%) were smokers; however, 42 fathers (3.2%) and five mothers (0.4%) had given up smoking.

DISCUSSION

A notable finding in this study was the high response rate, which was gratifying and indicated the intens of the society for taking part in public health programs.

Since pathologic confirmation of asthma had a high cost and wasn't available for epidemiologic studies, the clinical definition of asthma was used for such studies. In order to make definitions as uniform as possible, the ISSAC questionnaire was used in epidemiogic studies (1,28).

Our findings indicated that prevalence of asthma-ever was less than expected rate in Zarinshahr. This finding is similar to other studies performed in both developing (9,24,25,29) and developed countries (13,29,30,31). This is likely due to substituted-term usage by physicians to inform the parents about nature of disease. We found the prevalence of asthma-ever is increased along with aging.

After adjusting to other factors, the relation between prevalence of current asthma and age was not significant. This finding indicated that asthmatic children don't experience improvement, as they grow

older. Prior Iranian investigators (24,25) had showed similar results.

In Zarinshahr unlike most studies, girls had higher prevalence rate of asthma than boys. Although gender difference was significant by chi-square analysis, after adjusting for other risk factors, multi-variant analysis did not show gender difference in prevalence of asthma. This finding is likely due to the fact that girls spend more times indoor and involve with bakery, cooking, and carpet weaving.

Paternal smoking, positive family history, and keeping cat at home correlated with higher prevalence of asthma. These finding are similar to other studies (32,33).

There was no relation between the parent's education as well as maternal smoking and prevalence of asthma. Small proportion of maternal smoking among participants was probably the reason of the later finding.

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