

STUDY OF RISK FACTORS AND PREVALENCE OF ASTHMA SYMPTOMS AMONG UNIVERSITY STUDENTS IN BAGHDAD

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ABSTRACT

Asthma is a serious disease affecting the respiratory system leading to airway limitation, cough and wheezing. Asthma prevalence in adults is globally increasing with variations between and within countries. Data are lacking regarding the prevalence of asthma among adults in Baghdad-Iraq. Our study aimed to determine the risk factors and prevalence of asthma symptoms in Baghdad university students. A cross-sectional study was performed among Baghdad University students during the academic year 2016–2017. A modified translated International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire was distributed among Baghdad university students, males and females whose ages were ≥ 18 years and living in Baghdad for more than 1 year, and samples were taken using multistage random sampling. A total of 200 participants (128 males and 72 females) with a mean age of 21.50 ± 2.56 years were included in the study. The prevalence of asthma depending on the wheezing symptom in the past 12 months was 23% and physician-diagnosed asthma was 11.3%. Most of the asthmatic subjects (>82%) have intermittent symptoms. The first-degree family history, active tobacco smoking, allergic rhinitis (AR), smoke and eczema were the major risk factors for asthma symptoms. In conclusion, the study revealed a high prevalence of self-reported asthma symptoms among adults among Baghdad university students associated with a high prevalence of allergic rhinitis (AR), which needs a particular attention by the health stakeholders.

KEYWORDS: Asthma, Risk factors, Prevalence, Symptoms.

INTRODUCTION

Asthma is a disease characterized by chronic airway inflammation that results in wheezing, cough, and variable airflow limitation.^[1] The etiology of asthma is multifactorial in origin arising from a complex interaction of genetic and environmental factors.^[2,3] It seems likely that airway inflammation occurs when genetically susceptible individuals are exposed to certain environmental factors. Many factors are implicated in the development and exacerbation of asthma symptoms. These factors include dysregulated immunity, obesity, gender, allergy, indoor and outdoor air pollution, viral respiratory tract infection, diet, and drugs.^[4-7]

The global prevalence of asthma and other allergic diseases has significantly increased during the past three decades with substantial magnitude in some areas.^[8]

Global asthma prevalence was mapped depending on the results of two extensive multinational studies in both adults and children: (1) The European Community Respiratory Health Survey (ECRHS) in adults and (2) The International Study of Asthma and Allergies in Childhood (ISAAC) in children. The results of the two studies showed high asthma prevalence and respiratory

allergies, which are quite variable between countries and even within different regions of the same country.^[9] These variations may partly be explained by genetic differences; however, a critical role for environmental factors could not be ignored.

Conflicting results on adult studies in western countries showed an increase in wheeze and cough with age in English and Canadian and a decrease in the prevalence of wheeze in German.^[10-12]

In Africa, the ISAAC study through standardized symptom-based questionnaires involving 22 centers in 16 African countries provided valuable data on the patterns of asthma prevalence and the potential risk factors for asthma, allergic rhino conjunctivitis, and eczema. Relatively high prevalence was documented with several centers' estimates to current wheeze similar to those reported in European countries.^[13] In a recent Sudanese cross-sectional study including 3974 adult subjects, the average prevalence of asthma depending on the ISAAC questionnaire was 10% and ranged between 6.5% and 13% in the different regions of the country.^[14]

In the Arab world, two nationwide cross-sectional surveys in Oman as part of ISAAC Phase I (1995) and Phase III (2001) in two age groups (6–7 and 13–14 years) revealed a significant increase in the prevalence of wheeze in Omani schoolchildren from 8.7% to 13.8%.^[15] In North Africa, an Egyptian study including 2645 older schoolchildren in Cairo, the ISAAC questionnaire showed an asthma prevalence of 14.7% depending on wheezing symptom, and 9.4% physician diagnosed.^[16] In a total of 6543 subjects aged 8–93 years in Al-Ain, United Arab Emirates (UAE), the prevalence of self-reported asthma was found to be 13%.^[17]

In this context, the present study was designed to determine the risk factors and prevalence of asthma symptoms among Iraqi university students using the internationally adopted ISAAC approach, thereby, providing a base of information to asthma problem magnitude among adults in Iraq.

MATERIALS AND METHODS

This cross-sectional study was conducted during the academic year 2017–2018 on 200 male and female students of university of Baghdad whose ages were ≥ 18 years living in Baghdad for more than 1 year. Samples were taken using a multistage random sampling including random selection of the students, then a representative sample of students was randomly selected from lists of names. The sample size was calculated according to the following formula:

$$N = Z^2 Pq / d^2$$

Where N = minimum sample size; Z = normal standard deviation 95% confidence interval ($Z = 1.96$); P = prevalence of the disease; q = (1 – prevalence); and d = margin of error (0.05).

The modified translated ISAAC questionnaire was used to estimate asthma prevalence among the randomly selected students. The questionnaire included sociodemographic data, asthma symptoms, allergy symptoms, asthma diagnosis and symptom severity, medical history of allergic diseases, family history of asthma and allergy, and indoor and outdoor environmental factors.

All participants were informed about the objectives and the need for the present study. They were assured about the confidentiality of their information. Informed consent was obtained before the commencement of data collection.

Data Analysis was performed using version 21 SPSS program. Descriptive statistics and Chi-square tests with odds ratios (OR) for risk estimates were used; $P \leq 0.05$ was considered statistically significant.

RESULTS

The study included 200 adult students (128 males and 72 females) with a mean age of 21.50 ± 2.65 . The prevalence of asthma depending on the wheezing symptom in the past 12 months was 23%, and physician-diagnosed asthma was 11.3% (Figure 1). Wheezing was more correlated with shortness of breathing than other asthma symptoms (Table 1). Among asthmatics, males were more affected than females (Figure 2). The first-degree family history, active tobacco smoking, allergic rhinitis (AR), smoke, and eczema are the major risk factors for asthma symptoms (Table 2). Symptoms of AR were found to be more frequent during winter (Figure 3). Home dust was the most significant trigger for AR symptoms in asthmatic persons (Figure 4).

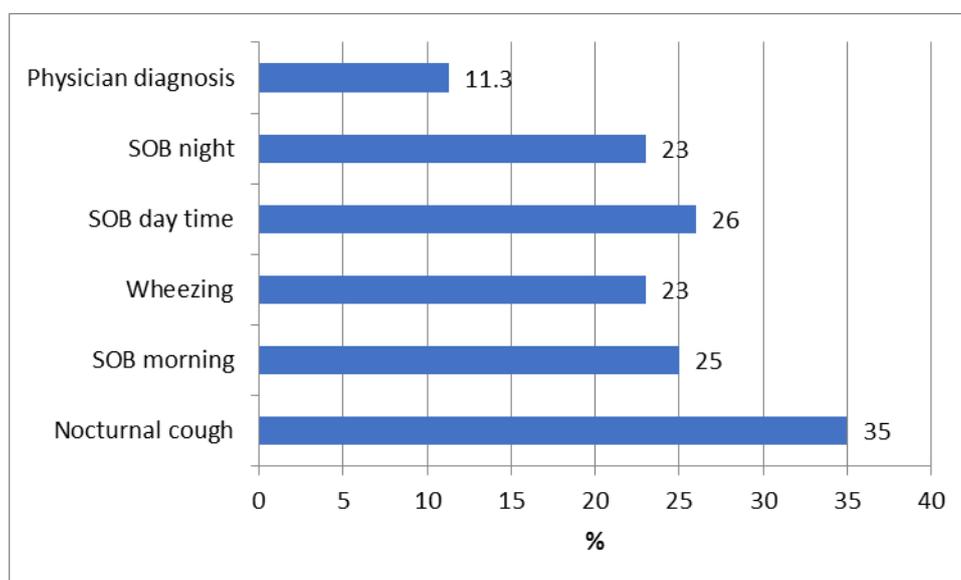


Figure (1): Prevalence of asthma according to presentation.

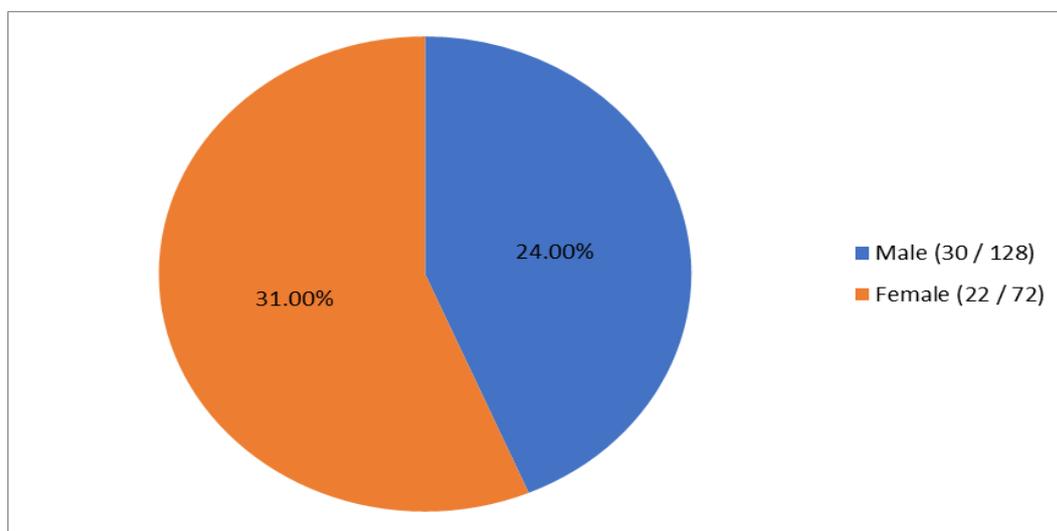
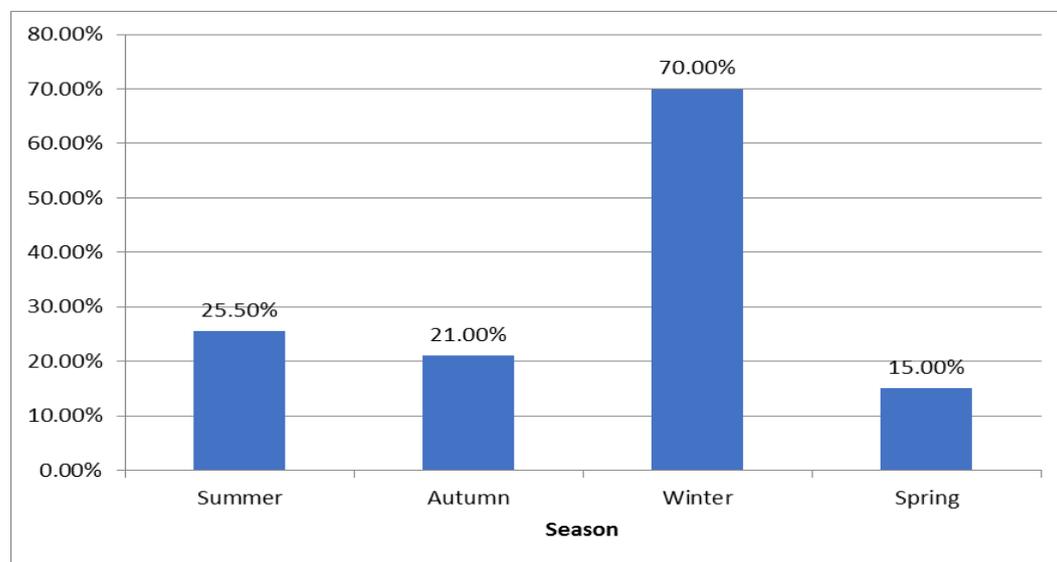
Table (1): Correlation between wheezing and other asthma symptoms.

Correlation	r**	P
Wheeze +SOB* early morning	0.43	<0.001
Wheeze +SOB* daytime	0.48	<0.001
Wheeze +SOB* night	0.35	<0.001
Wheeze +Nocturnal cough	0.30	<0.001

*SOB: Shortness of breathing, **r: Correlation coefficient

Table (2): Risk factors for asthma symptoms / asthma attacks.

Risk factor	% in asthmatics (n=52) (%)	% in non-asthmatics (n=148) (%)	Odds ratio (95% CI)	P
Family history of asthma	36 (69.2)	67 (45.3)	2.72 (1.39-5.33)	0.002
Active smoking	9 (17.3)	9 (6.1)	3.23 (1.21-8.66)	0.019
Allergic rhinitis	41 (78.8)	81 (54.7)	3.08 (1.47-6.46)	0.001
Smoke	26 (50.0)	37 (25.0)	3.00 (1.55-5.80)	<0.001
Dusty environment	37 (71.2)	85 (57.4)	1.83 (0.92-3.62)	0.055
Chemicals	14 (26.9)	27 (18.0)	1.65 (0.79-3.47)	0.230
Eczema	16 (30.7)	15 (10.1)	3.94 (1.78-8.73)	<0.005
Domestic animals	32 (61.5)	77 (52.0)	1.48 (0.77-2.81)	0.260

**Figure (2): Gender variation in asthma symptoms.****Figure (3): Incidence of allergic rhinitis in relation to season among asthmatic patients.**

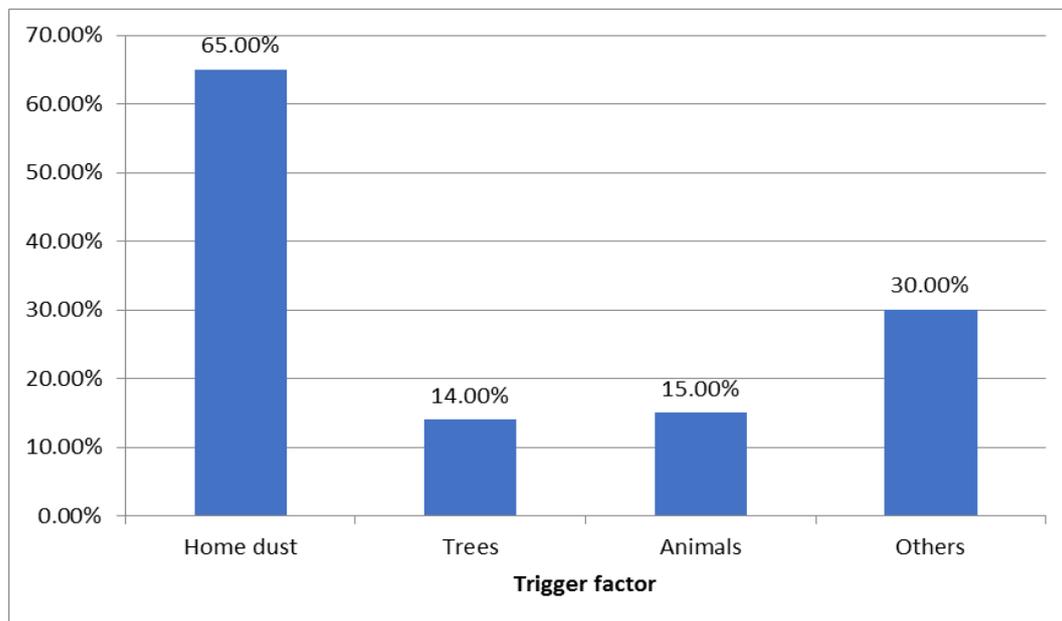


Figure (4): Symptoms of allergic rhinitis in relation to triggering factors among asthmatic patients.

DISCUSSION

The present study is the first study conducted in Iraq to determine the prevalence of asthma and its risk factors among the adult age group. The prevalence of asthma depending on wheezing symptom in the past 12 months as guided by the ISAAC was 23%. The prevalence of physician-diagnosed asthma was 11.3%. Males reported a higher prevalence of asthma symptoms compared to females. The risk factors for asthma symptoms included a family history of asthma, AR, active smoking, and a dusty environment. Asthma and AR coexistence was observed in nearly 80% of the asthmatic group.

Different environmental factors may explain this variation. Baghdad area has bouts of a dusty climate in most months of the year, which may be a risk factor for the higher prevalence of asthma symptoms. However, depending on wheezing symptom alone may overestimate asthma prevalence, as any noisy chest condition in the past 12 months could be self-reported as wheeze. It is strongly advised to adopt a combination of asthma symptoms (wheeze plus). According to the current results, wheezing was more correlated with early morning shortness of breathing; therefore, a combination of wheezing plus early morning chest tightness is a justified suggestion that proved to yield nearly objective asthma prevalence.^[18] On the other hand, the present study showed that the prevalence of physician-diagnosed asthma was 11.3%. Self-reported asthma yields subjective estimates; therefore, pulmonary function tests (bronchial reversibility and provocation tests) are suggested to validate self-reported asthma in the questionnaire-based prevalence surveys. Concerning gender variation in asthma prevalence, the present study showed a higher prevalence of asthma among male students. This result is inconsistent with international literature documenting female asthma predilection.^[19-21] Many asthma risk factors were reported by the present

study, including a family history of asthma, AR, active smoking, and a dusty environment. These factors may explain the regional variation in asthma prevalence and the pathogenesis of asthma documented by many studies.^[2,3] In this study, almost 80% of the asthmatic group reported symptoms of AR and the adjusted OR showed a 3 times chance of asthmatic to have symptoms of AR. This result agrees with several studies reporting a high percentage of AR among asthmatic subjects (Masuda et al [78%] and Prasad et al [80%]), as well as being a significant risk factor for asthma in Sudanese and Korean studies.^[22] This finding justifies considering AR in the protocol of asthma management for better prevention and control. The symptoms of AR were found higher during winter and were mostly triggered by house dust. This may be explained by the relatively higher frequency of dusty environment during winter season in Baghdad.

The strength of the current study is the use of the internationally adopted ISAAC questionnaire as a basis of asthma estimation and having a representative sample of university students depending on the previous local studies. The limitation of the present study is the generalization of its results to the whole community as the sample size is mainly university students. Therefore, the study results could be considered as a pilot for a community-based survey to estimate asthma prevalence in the country.

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