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Original Article

Prevalence of Asthma Control in Adult Patients in Kirkuk City

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Abstract

Background: Asthma is one of the most common chronic diseases that is widely prevalent worldwide affecting different age groups. Many factors are involved in the pathogenesis and there are many trigger factors that can precipitate acute attacks or interfere with the disease control. Disease controlling inhalers are required to be taken for long duration to control the symptoms, and this is a real problem with the patients to maintain remission and prevent relapse or deterioration in the lung function. **Objective:** The aim of this study is to know the prevalence of asthma control in adult patients in Kirkuk city. **Materials and Methods:** Two thousand and five hundreds asthmatic patients were collected from Azadi teaching hospital and private clinics at Kirkuk city during the period from January 2017 to October 2022 (1775 were men and 725 were women. A proper history was taken from the patients regarding the duration of the asthma, treatment used and compliance, smoking, and presence or absence of gastroesophageal reflux disease (GERD). The body mass index (BMI) of the patients was also measured. Regarding the asthma control during the past 4 weeks, this was assessed by using the asthma control test. **Results:** From the total 2500 asthmatic patients: 2280 (91.2%) were not well-controlled, 220 (8.8%) at least well-controlled, 1590 (63.9%) of patients were on treatment, 1370 (86%) of those on treatment were not well-controlled, and 220 (14%) were at least well-controlled. Obesity, smoking, passive smoking GERD, and non-adherence to inhalers are all associated with poorly controlled asthma. **Conclusion:** The study shows that most of the asthmatic patients with uncontrolled smoking exposure, GERD, obesity, and non-adherence to controlling inhalers were significantly associated factors. Most of the patients were not on regular controlling inhaler therapy. Rejection of the diagnosis, cost, and technique were all causes for the non-adherence to disease-controlling inhalers.

Keywords: Asthma, gastro esophageal reflux disease, obesity, smoking

Introduction

Asthma is a chronic inflammatory disease of the airways, in which a lot of cells and cellular elements are involved in this inflammation. This chronic inflammatory process is associated with airway hyper-responsiveness that leads to recurrent attacks on bronchospasm causing breathlessness, wheezing, chest tightness, and coughing, especially at night and in the early morning. These attacks of asthma affect patients' life style negatively, causing impairment of sleep and decrease in work productivity.[1]

Different factors can exacerbate asthma control and trigger attacks, such as tobacco smoking, dust mites, exercise, cold weather, mold, and pets. Air pollution is an important trigger that should be considered especially in Kirkuk city, because of the smoke and pollution that are caused by oil companies.[2]

Asthma is one of the most common non-communicable diseases that affect about 300 million people worldwide. This high prevalence made asthma a major global health issue causing significant burden of illness associated with it. A study done by Accordini *et al*.[3] has shown a high burden of illness associated with asthma, particularly negative consequences being decreased health quality of life, low work productivity, decreased daily activity, and increased health resource utilization in Europe.

Studies revealed that the burden of illness is not associated with asthma itself but mostly with a poor control of asthma. World Health Organization and The National Health, Lung and Blood Institute established the Global Initiative for Asthma (GINA) guidelines in 1995 to specifically address the level of asthma control, and helping the physicians to

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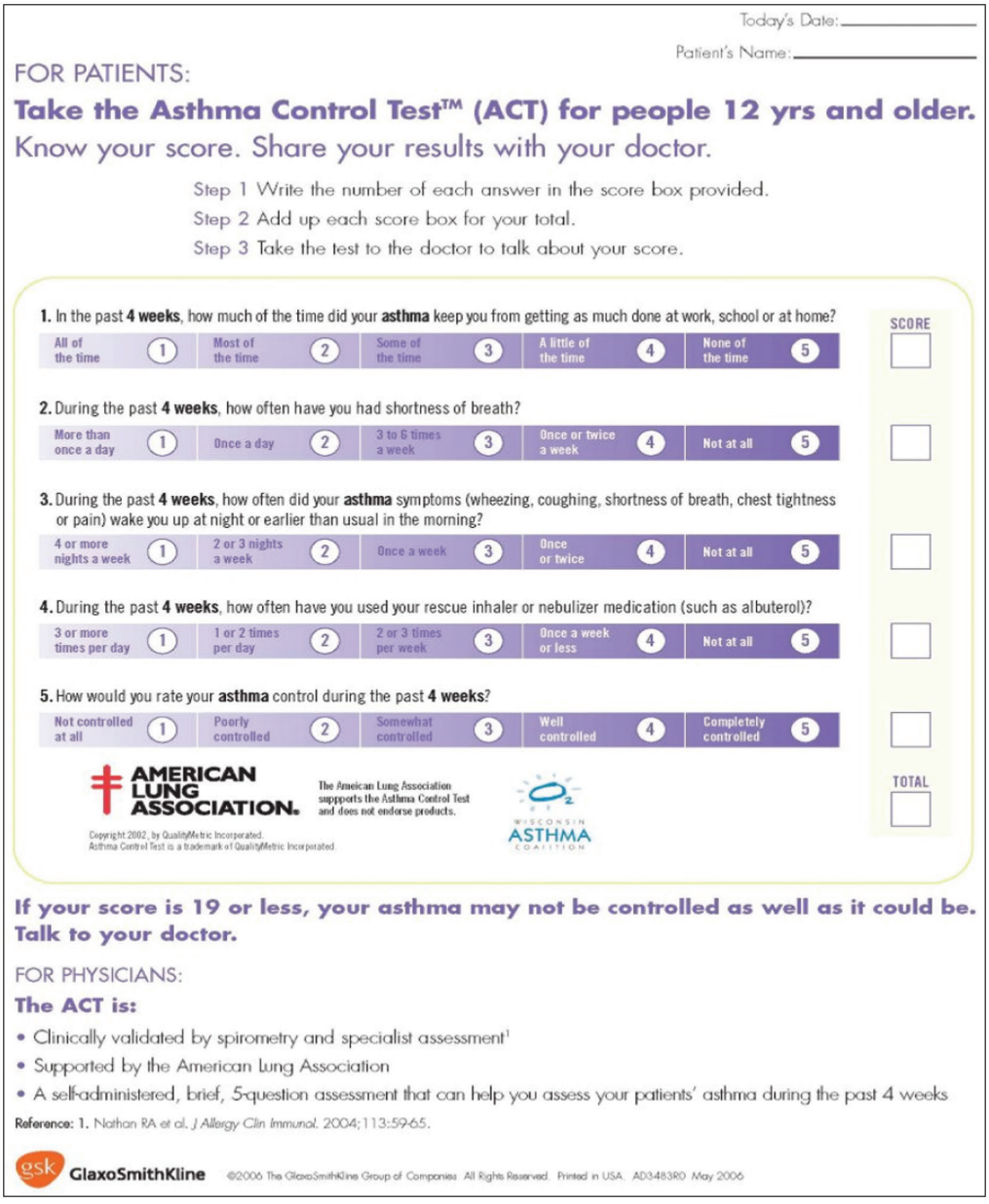
choose the most appropriate treatment options for each patient. The consequences of poorly controlled asthma range from increased risk of exacerbations, poor life quality, work absence, emergency room visits, and death.[2]

Despite the availability of different types of asthma treatment, especially the inhalers, there are confirming data worldwide showing that most of the asthmatic patients are poorly controlled. In 1999, Asthma Insight and Reality Europe (AIRE) study. was conducted for the assessment of the level of asthma control in seven European countries. This study revealed the level of asthma control in the 12 months before interview, based on the GINA guidelines. The results showed that in the 5 years between the GINA guidelines and the AIRE study, only 5.1% of adult patients had well-controlled asthma.[4]

As asthma is an inflammatory process that causes reversible airway obstruction, poorly controlled asthmatic patients are at the risk of suffering from chronic symptoms due to the remodeling of their airways that will be also poorly responsive to the treatment. Such studies are important to assess the level of asthma control, especially after the various changes in the management of asthma made by the GINA guidelines within the last 10 years.[5]

Materials and Methods

Two thousand and five hundreds asthmatic patients cross sectional study were collected from Azadi teaching hospital and private clinics at Kirkuk city from the period



Today's Date: _____

Patient's Name: _____

FOR PATIENTS:

Take the Asthma Control Test™ (ACT) for people 12 yrs and older.

Know your score. Share your results with your doctor.

Step 1 Write the number of each answer in the score box provided.
Step 2 Add up each score box for your total.
Step 3 Take the test to the doctor to talk about your score.

					SCORE
1. In the past **4 weeks**, how much of the time did your **asthma** keep you from getting as much done at work, school or at home?	All of the time 1	Most of the time 2	Some of the time 3	A little of the time 4	None of the time 5	
2. During the past **4 weeks**, how often have you had shortness of breath?	More than once a day 1	Once a day 2	3 to 6 times a week 3	Once or twice a week 4	Not at all 5	
3. During the past **4 weeks**, how often did your **asthma** symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?	4 or more nights a week 1	2 or 3 nights a week 2	Once a week 3	Once or twice 4	Not at all 5	
4. During the past **4 weeks**, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?	3 or more times per day 1	1 or 2 times per day 2	2 or 3 times per week 3	Once a week or less 4	Not at all 5	
5. How would you rate your **asthma** control during the past **4 weeks**?	Not controlled at all 1	Poorly controlled 2	Somewhat controlled 3	Well controlled 4	Completely controlled 5	
					TOTAL

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If your score is 19 or less, your asthma may not be controlled as well as it could be. Talk to your doctor.

FOR PHYSICIANS:

The ACT is:

- Clinically validated by spirometry and specialist assessment[1]
- Supported by the American Lung Association
- A self-administered, brief, 5-question assessment that can help you assess your patients' asthma during the past 4 weeks

Reference: 1. Nathan RA et al. *J Allergy Clin Immunol.* 2004;113:59-65.

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Figure 1: Taking the ACT-form

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from January 2017 to October 2022 (1775 were men and 725 were women). All the participants in the study were adults (age >18 years). A proper history was taken from the patients about the duration of the asthma, treatment used, and compliance, smoking, body mass index (BMI) was measured: underweight ≤ 18.5, normal weight = 18.5–24.9, overweight = 25–29.9, obesity = BMI of 30 or greater. Spirometry was done for all the patients.

Regarding the asthma control during the past 4 weeks, this was assessed by using the Asthma Control Test (ACT) [Figure 1]. The ACT is a patient-administered measure that can be used in clinical care settings. It is a validated and reliable metric for patients aged >12 years. Asthma Control Test scores are ranging from poor control (5) to total asthma control (25). At least well-controlled asthma is defined as an ACT score of >20 and not well-controlled asthma is defined as an ACT score of <19.

Regarding the spirometry, normal spirometry is a maker of well-controlled asthma and FEV_1 < 80% is considered as poorly controlled, in addition to other the obstructive parameters such as low peek expiratory flow and forced expiratory flow in one second divided by forced vital capacity less than 70%.

Statistical analyses

Statistical Package for the Social Sciences (version 21.0 for windows, SPSS, Chicago, Illinois) was used to perform the statistical analyzes. Data for quantitative variables, number, and percentage for qualitative variables are presented as a χ^2 test. Relations with the χ^2 test have been studied. *T*-test students were used to test group differences. *P*-value < 0.05 was considered statistically significant.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 21 in January 4, 2023.

Results

Regarding the asthma control, Table 1 shows that from the total 2500 asthmatic patients: 2280 (91.2%) were not well-controlled, 220 (8.8%) at least well-controlled, 1590 (63.9%) of patients were on treatment, 1370 (86%) of those on treatment were not well-controlled, and 220 (14%) were at least well-controlled.

Table 2 shows the health characteristics and demographic data of the asthmatic patients, total number was 2500 patients, 1775 (71%) men, 725 (29%) women, 275 (11%) with normal BMI, 1725 (69%) overweight BMI, and 500 (20%) asthmatics were obese. A total of 550 (22%) of the asthmatics were smokers and 228 (9%) were passive smokers. In that, 875 (35%) was complaining from gastroesophageal reflux disease, which is an important trigger for asthma.

Table 1: Prevalence of asthma control

Category	Number and %	*P*-value
Not well-controlled (% diagnosed)	2280 (91.2%)	<0.001
At least well-controlled (% diagnosed)	220 (8.8%)	<0.05
Treated asthma (% diagnosed asthma)	1590 (63.9%)	<0.001
Not well-controlled (% treated)	1370 (86%)	<0.001
At least well-controlled (% treated)	220 (14%)	<0.001

Table 2: Health characteristics & demographic data of the asthmatic patients

Male	1775 (71%)
Female	725 (29%)
Normal BMI	275 (11%)
Overweight BMI	1725 (69%)
Obese	500 (20%)
Smokers	550 (22%)
Passive smokers	228 (9%)
Gastroesophageal reflux disease (GERD)	875 (35%)

Table 3: Health characteristics and demographic data of the asthmatic patients and their asthma control

	Number and % of not well-controlled	Number and % of least well-controlled	*P-value*
N = 2500	2280 (91.2%)	220 (8.8%)	<0.001
Male	1420 (80%)	355 (20%)	<0.001
Female	435 (60%)	290 (40%)	<0.01
Normal BMI	50 (18%)	225 (82%)	<0.01
Overweight BMI	1380 (80%)	345 (20%)	<0.001
Obese	475 (95%)	25 (5%)	<0.001
Smokers	550 (100%)	0	<0.001
Passive smokers	228 (100%)	0	<0.001
Gastroesophageal reflux disease (GERD)	750 (86%)	125 (14%)	<0.001

Table 3 shows the relationship between the health characteristics and demographic data of the asthmatic patients and their asthma; from the total 2500 patients, 2280 (91.2%) were not well—controlled and 220 (8.8%) were at least well—controlled.

Table 4 shows disease and treatment characteristics of asthmatics regarding the severity of asthma (mild, moderate or severe, number of visiting doctors last year, using rescue medication, using inhalers, and the relationship of all these with the asthma control. Only the majority (70%)) of the mild intermittent asthma were at least well-controlled, and 80% of those using inhaler medications are also at least well-controlled.

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Table 4: Disease and treatment characteristics of asthmatics

	Not well-controlled	At least well-controlled	*P-value*
Subjects number	2280	220	<0.001
Years since diagnosis of asthma	15 + 12.3	14 + 11.5	
Asthma severity			
Mild intermittent	450 (20%)	154 (70%)	<0.01
Mild persistent	720 (32%)	44 (20%)	<0.001
Moderate persistent	855 (38%)	11 (5%)	<0.001
Severe persistent	225 (10%)	11 (5%)	<0.01
Number of doctor visit last year			
0	225 (10%)	33 (15%)	<0.001
1	585 (26%)	44 (20%)	<0.001
2	675 (30%)	55 (25%)	<0.001
3	450 (20%)	55 (25%)	<0.001
>4	315 (14%)	33 (15%)	<0.001
Use of rescue medication	1350 (60%)	10 (22%)	<0.001
Use of controlling inhalers	675 (30%)	176 (80%)	<0.001

Table 5: The possible causes of uncontrolled asthma

Causes	Not well-controlled	At least well-controlled	*P*-value
Smokers	470 (25%)	0	<0.001
Passive smokers	684 (30%)	0	<0.001
Exposed to gases	228 (10%)	0	<0.001
Cost issues	1368 (61%)	110 (50%)	<0.001
Technique	198 (35%)	0	<0.001
Non-compliance	1350 (60%)	0	<0.001
Not-convinced with diagnosis	495 (22%)	0	<0.001

Table 5 possible causes of uncontrolled asthma, include smoking, passive smoking, and exposure to irritant gases, and all the patients exposed to the above factors were not well-controlled. Also, the patients asked about compliance and the causes of non-compliance, such as cost or technical issues.

Discussion

Most of the patients involved in the study are not-well-controlled, yet men patients were more poorly controlled. Overweight, obesity, GERD, and non-compliance were all significantly associated with poorly controlled asthma.

This study shows that most of the asthmatic patients in Iraq are not well-controlled (91.2%) however, just 8.8% were at least well-controlled. Despite the updates in GINA guideline in asthma management, the results were analyzed to assess the level of asthma control according to the GINA guidelines. This finding agrees with AIRE study.[6] Our findings were compared to studies conducted by others recently. The Reality of Asthma Control (TRAC) study was conducted in Canada in 2004. It revealed that 53% of adults aged 18–54 years whom complained from asthma were uncontrolled and asthma control was being assessed by symptom-based guidelines.[7] Another study done by P. Demoly *et al*. in Europe, about asthma control in Germany, Italy, France, Spain, and UK also showed that most of the asthma patients were not well-controlled.[8] Our study found that 63.9% of the diagnosed asthma patients were on regular treatment; from these treated asthmatics 86% were not well-controlled and 14% were at least well-controlled. These findings agreed with the study done by Demoly *et al*.[8] about asthma control in Europe.

The findings in our study were compared to studies conducted by others recently. The Reality of Asthma Control (TRAC) study, that was conducted in Canada in 2004, has found that 53% of adults aged 18–54 years who diagnosed as asthma were uncontrolled and the control of asthma being was assessed by symptom-based guidelines.[7] Other famous study, the INSPIRE study, conducted in eight European countries, Canada, Australia, and the USA, has also found similar results, with 51% not being controlled, asthma control being assessed by the Asthma Control Questionnaire.[9] The findings also agreed with (REALISE) survey, a study conducted in 8000 asthmatic patients from 11 European countries, assessing their asthma control by a questionnaire depending on the signs and symptoms.[10]

The study shows that asthma is more common in men than women, and in both genders it is poorly controlled; this agrees with a study conducted by Chowdhury *et al*.[11] (sex and gender in asthma). Asthma was more common in overweight and obese and was more difficult to control in these two groups; this agrees with Ubong Peters, Anne Dixon, and Erick Forno, in their study (Obesity and Asthma)[12] and with Juel CT, Ulrik CS. (Obesity and asthma: impact on severity, asthma control, and response to therapy).[13] All the smokers and passive smokers were uncontrolled, and this agrees with Megan Stapleton *et al*. (smoking and asthma).[14]

The study shows that asthma control is poor with increasing its severity, from mild intermittent, mild persistent, moderate persistent, and severe persistent, and this agrees with Nathan *et al*.[15] and Demoly *et al*.[8] in Europe, about asthma control in Germany, Italy, France, Spain and UK. Not well-controlled asthma sufferers report poorer treatment compliance. Education programs by physicians and patients need to address the importance of treatment compliance for asthma control. Physicians have to understand that when asthmatic patients acknowledge the burden of their condition, they do not always realize the level of their asthma control appropriately. Fewer patients self-rate their asthma as poorly controlled compared to those who truly are not well-controlled; this agrees with Nathan *et al.*, in their study Development of the asthma control test: a survey for assessing asthma control.[15] There

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was a significant association between GERD and poorly controlled asthma and this agrees with a study conducted by Bilal and Mohammed (gastroesophageal reflux disease in asthma).[16]

The study shows that 60% of the uncontrolled asthmatics were using rescue medication and most of them were visiting physicians three times a year; this agrees with Clark *et al.*,[17] From the total 2500 asthmatics, 851 were using controller inhalers, 675 (30%) of these patients were controlled, and 176 (80%) were uncontrolled. Two reasons of the causes of not using inhalers were the technique and the cost, but also was a rejection to asthma diagnosis; this agrees with Sawsan Baddar, B Jayakrishnan, Omar A Al-Rawas in their study, Asthma control;[18] also agrees with Andrea S Melani Inhaler technique in asthma and COPD.[19] Gastro Esophageal Reflux Disease was significantly associated with poorly controlled asthma and this agree with other studies published before.[16,20-23]

Conclusion

The study shows that most of the asthmatic patients are uncontrolled, smoking exposure, GERD, obesity, non-adherence to controlling inhalers were significantly associated factors. Most of the patients were not on regular controlling inhaler therapy. Rejection of the diagnosis, cost, and technique were all causes for the non-adherence to treatment.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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