Asthma control assessment using asthma control test among patients attending 5 tertiary care hospitals in Saudi Arabia

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ABSTRACT

الأهداف: تقييم مدى السيطرة أو التحكم في الربو بإستخدام إختبار السيطرة على الربو (ACT).

الطريقة: استخدام اختبار مدى السيطرة أو التحكم في الربو (ACT) على عينة من مرضى الربو المتابعين في عيادات الأمراض الصدرية في خمسة مستشفيات متخصصة في مدينة الرياض – المملكة العربية السعودية. أجريت هذه الدراسة في الفترة ما بين 1سبتمبر وحتى 31 نوفمبر من عام 2006م، حيث تم دراسة ما يقارب 300 مريض من كل مستشفى.

النتائج: بلغ مجموع عدد المرضى المشاركين 1060 مريضا. عدد الذكور 442 (42%) وعدد الإناث 618 (58%)، معدل الأعمار 38.56 (يتراوح ما بين 15–75 عاماً). ما يقارب الثلث لم يحصل على تعليم رسمي. بين اختبار مدى السيطرة أو التحكم في الربو (ACT) إن عدد المرضى الذين يعتبرون أن الربو غير مسيطر عليه يبلغ 677 (64%)، والذين يعتبرون الربو مسيطر عليه بنحو طيب (شبة كامل) يبلغ عددهم 328 (31%)، والذين يعتبرون الربو مسيطر عليه بنحو ممتاز وكامل 55 (5%). كما بينت الدراسة انه لا يوجد ارتباط ما بين مستوى التحكم في الربو والعمر اقل من أربعين عاماً (0.12=p)، علما بان نسبة التحكم في الربو كانت أفضل لدى الفئة العمرية اقل من 20 عاماً مقارنة بالفئة العمرية الأكبر (0.0001=p). كما تبين أن نسبة التحكم في الربو كانت أفضل لدى الذكور 44% مقارنة بالإناث 30% (0.0001=p).

خاتمة: مدى السيطرة أو التحكم في مرض الربو مازال مصدراً للقلق وغير مرضي، ويحتاج إلى مزيد من الدراسات لمعرفة الأسباب المؤدية لذلك.

Objective: Evaluation of asthma control using the Asthma Control Test™ (ACT).

Methods: The ACT was used to assess asthma control among patients with bronchial asthma visiting pulmonary clinics in 5 major tertiary care hospitals in Riyadh, Kingdom of Saudi Arabia. Each hospital had a target of 300 patients to recruit over the period of the study from the 1st September to 30th November 2006.

Results: The total number of patients studied was 1,060 patients. Males constituted 442 (42%) and females constituted 618 (58%), the median age was 38.56 years (range 15-75). One third of patients had no formal education. The ACT score revealed uncontrolled asthma in 677 (64%), well-controlled asthma in 328 (31%), and complete controlled in 55 (5%). There are no significant correlations between the age below 40 and above 40 years and level of asthma control ($p=0.12$). However, the younger age group (less than 20) had better control of asthma in comparison with older patients ($p=0.0001$). There was a significant correlation between level of asthma control and gender, males (44%) had better asthma control than females (30%) ($p=0.0001$).

Conclusion: Control of bronchial asthma is still a major concern in our population. Further studies are needed to explore the factors leading to poor asthma control.

The primary goal of asthma management, according to international guidelines, is to achieve good asthma control. This is defined as the minimization of symptoms, activity limitation, airway narrowing and rescue bronchodilator use, with prevention of acute exacerbations.[1,2] Asthma control is typically assessed by review of symptoms and measurement of airflow obstruction by spirometry or peak flow. Recently, the role of questionnaires to assess asthma control has been established. However, despite the existence of treatment guidelines, recent studies suggest that the asthma symptom burden might be significantly higher than previously estimated.[3] As a result, many patients with asthma continue to be under-treated, and are at risk for acute exacerbations resulting in missed work or school, increased use of expensive health care services, and reduced quality of life. The fact that the level of asthma control is often overestimated by both patients and physicians, indicates that asthma treatment guidelines alone, are not enough to ensure the proper assessment of asthma control.[4-8] Although several investigators have developed tools that quantify asthma control, either the performance of these tools has not been well validated, or they are difficult to score and require measures that are not currently integrated into clinical practice.[9] The Asthma Control Test™ (ACT) is a 5-item questionnaire that has been developed as an easy method for patients and clinicians to assess symptoms, use of rescue medication, and impact on activities.[8] The ACT has been validated and recognized by many as an effective, patient friendly tool to assess the control of asthma, with much more convenience and adaptability than previous questionaires.[10-14] This test will be used for our study, as the only tool for evaluation of asthma control.

Methods. The study was carried out in 5 major tertiary hospitals in Riyadh, Kingdom of Saudi Arabia. The participating hospitals are, King Fahad National Guard, King Faisal Specialist Hospital and Research Centre, King Khaled University Hospital, Riyadh Military Hospital, and Riyadh Security Forces Hospital. Each hospital had a target of 300 patients to recruit over the study period from 1st September to 30th November 2006. The Saudi Thoracic Society Research and Ethics Committee reviewed, and approved this study. All asthmatic patients attending pulmonary clinics were asked by treating consultants to participate in the study. Patients', who agreed to participate, were asked to self-complete the ACT

questionnaires. The official Arabic translation was used, and the content was reviewed by participating pulmonary consultants. The revised questionnaire was then pre-tested with 50 patients. This process allowed the questionnaire to be checked for proper flow or for any potential problem regarding possible misinterpretation or misunderstanding by patients. Based on pre-test results, necessary adjustments were made to produce the finalized version of the questionnaire to be used in this study. The standard ACT consists of 5 questions, and each question has 5 answers. The final scored responses to these questions were used to assess asthma control in the subjects studied. Scores equal or less than 19 were considered uncontrolled, scores of 20-24 were considered well controlled, and scores of 25 points were considered completely controlled. Once the patient completed the ACT questionnaire to the best of his or her ability, a designated member of the study team interviewed him or her face-to-face. The interviewer completed the demographic information, and made sure that all the questions were answered, and also helped explain the questions, and answered the questions for the patients who could not read or write.

The data collected was computer-analyzed using the SPSS statistical package. Descriptive statistics such as means and standard deviation were used to summarize the quantitative variables. Frequency counts, and percentages were used to summarize category variables. Chi-square test was used to test statistical significance of differences between categorical variables and odds ratio along with 95% confidence intervals were calculated. Differences were considered significant if the *p*-value is <0.05.

Table 1 - Patient population according to age and gender.

Characteristics	n (%)
Age	
<20	132 (12)
20-39	300 (28)
40-60	402 (38)
>60	226 (21)
Gender	
Males	442 (42)
Females	618 (58)
Levels of education	
None	320 (30)
Primary	139 (13)
Intermediate/Secondary	373 (35)
More than secondary school	228 (22)

Results. The total number of patients studied was 1,060. Males comprised 442 (42%), and females comprised 618 (58%), the median age was 38.56 years (range 15-75). Almost one third of the patients had no formal education (**Table 1**). The ACT score revealed uncontrolled asthma in 667 (64%), well-controlled asthma in 383 (31%), and completely controlled in 55(5%). The number of completely controlled asthma patients is small, therefore, the data presented as uncontrolled ACT score equal or less than 19 and controlled score is 20 or more. There are no significant correlations between age below 40 and above 40 year, and level of asthma control (*p*=0.12). However, the younger age group (less than 20 years old) had better asthma control compared to the older age group (*p*=0.0001). There was also a significant correlation between level of asthma control and gender, 44% of males have controlled asthma, while only 30% of females have controlled asthma, (*p*=0.0001) (**Table 2**). There is also significant correlation between level of education

and asthma control, 71% of patients who did not have formal education had uncontrolled asthma (*p*=0.001) (**Table 3**).

Discussion. Bronchial asthma is a common condition that affects 5-10% of the population worldwide, the incidence and prevalence of which have increased during the past 20 years.[1,2,15,16] The prevalence of asthma in the general population is 6.4% in the United States,[17] and 4% in Saudi Arabia.[18,19] In addition to the health impact of asthma, there are also substantial economic costs. These include costs related to health services expenditure, loss of school and work time, leading to poor scholastic performance, and decreased productivity and disease-related morbidity and premature mortality. Asthma mortality and morbidity are still unacceptably high. More recent increases in asthma mortality reported from Britain, France, and the United States may be related to the increased prevalence or severity of asthma or inadequate health care.[15-17]

Table 2 - Correlation between asthma control, age, and gender.

Parameters	Uncontrolled n (%)	Controlled n (%)	Total	OR	95% CI	*p*-value
Asthma control according to age group						
<20	66 (50)	66 (50)	132	0.52	(0.35-0.76)	0.0001
20-39	198 (66)	102 (34)	300	1.14	(0.85-1.52)	0.36
40-60	266 (66)	136 (34)	402	1.18	(0.90-1.54)	0.22
>60	147 (65)	79 (35)	226	1.07	(0.78-1.47)	0.67
Total	**677**	**383**	**1060**			
Asthma control according to gender						
Male	247 (56)	195 (44)	442	0.55	(0.43-0.72)	0.0001
Female	430 (70)	188 (30)	618			
Total	**677**	**383**	**1060**			
OR - odds ratio, CI - confidence interval						

Table 3 - Asthma control according to educational level.

Educational level	Uncontrolled n (%)	Controlled n (%)	Total	OR	95% CI	*p*-value
None	228 (71)	92 (29)	320	1.61	(1.20-2.15)	0.001
Primary	90 (65)	49 (35)	139	1.05	(0.71-1.54)	0.81
Intermediate/ Secondary	219 (59)	154 (41)	373	0.71	(0.54-0.93)	0.01
More than secondary school	140 (61)	88 (39)	228	0.87	(0.64-1.20)	0.38
Total	**677**	**383**	**1060**			
OR - odds ratio, CI - confidence interval						

Saudi Arabia is no exception.[20] The high morbidity and mortality have been attributed in part to poor compliance. Studies have reported that 50% of patients with chronic asthma do not use their medication at all, or do not use them as prescribed.[21-24] Compliance in our study was only assessed by the ACT, and did not include other measurements such as spirometry or use of peak flow measurement. However, the ACT has been validated and recognized by many as an effective, patient friendly tool to assess the control of asthma.[11-14]

The strength of our study includes a recorded number of more than 1,000 patients treated at the tertiary hospitals. Excellent facilities and infrastructures include availability of a specialist in treating bronchial asthma, asthma educators, and most important patients, enjoy free dispensing of asthma medication. However, more than 60% of the patients have uncontrolled bronchial asthma. It is well known that there are many factors leading to poor asthma control. One of the major reasons for poor asthma control is poor compliance. Compliance with asthma treatment is reported to vary between 20-75%.[24-26] Our study demonstrates that asthma control is poor. It is well known that there are many factors that may lead to poor compliance, these include, education level, perception, concerns over using inhaled corticosteroid, and economic factors.[24-26]

Our study did not examine why these patients have, or what factors led to poor asthma control. However, this finding is quite disconcerting, and should be taken seriously by health professionals to study the reason for poor asthma control. Al-Jahdali et al[24] reported the factors pertinent to Saudi adult asthmatic patients that lead to poor compliance. The 2 major reasons for poor compliance in our population were misconception of the role of inhaled steroid in treatment of bronchial asthma, and fear of side effects of the steroid. These factors may easily be overcome by emphasizing more on patient education, in particular, the role of inhaled steroid in asthma treatment and to directly address patients concerns and misconceptions.

In conclusion, this study clearly revealed poor asthma control in our population. Further studies are needed to explore the factors leading to poor asthma control.

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