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Is Clinical Judgment of Asthma Control Adequate?

A prospective survey in a tertiary hospital pulmonary clinic

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هل يكفي الحكم السريري لتقدير مدى السيطرة على مرض الربو؟

مسح استباقي في عيادة الأمراض التنفسية بمستشفى مرجعي ثالثي

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الملخص: الهدف: توجد صعوبة في قياس مدى السيطرة على مرض الربو. تهدف هذه الدراسة لعمل مقارنة بين الحكم السريري و بين المبادرة العالمية لمرض الربو(GINA) في تقدير مستوى السيطرة على مرض الربو. **الطريقة:** قام أطباء عيادة الجهاز التنفسي في مستشفى مرجعي ثالثي مبدئيا بتقدير مدى السيطرة على مرض الربو باستخدام الحكم السريري ل 157 مريض متتالي. ثم بعد ذلك باستخدام التقدير المبني على المبادره العالميه للربو(GINA) لكل مريض على حده. **النتائج:** بلغت نسبة التوافق بين الحكم السريري وتقدير المبادرة العالمية للربو(GINA) للأطباء في 106 حالة (67.5%). في بقية حالات التناقض (51; 32.5%)، كان معدل السيطرة على المرض باستخدام الحكم السريرى اعلى بمستوى درجه واحدة مقارنه مع المبادرة العالمية. نسبة التوافق كانت أعلى لدى أخصائيي الأمراض الصدرية (72%) مقارنة بغير الأخصائيين (47%; P = 0.009). تقديرالأطباء لمدى السيطرة على المرض كان مثالي ل76 (48.4%) بإستخدام الحكم السريري مقارنه مع 48 (30.6%) باستخدام معايير GINA (P <0.001). في الجانب الاخر قدر الأطباء أن نسبة عدم السيطرة على المرض بلغ 34 (21.7%) مريض باستخدام الحكم السريري مقارنة مع 57 (36.3%) مريض باستخدام معيار GINA. (P <0.001) في 28 مريض الذين صنفوا على أن مدى السيطرة على المرض لديهم كان كاملا باستخدام الحكم السريري وغير كامل باستخدام مبادرة GINA، هذا الاختلاف راجع إلى النقص فى مقياس ذروة التدفق الزفيري (PEFR) (46.7%) و النقص في النشاط اليومي (21.4%) واللذان يعتبران أكثر العوامل المؤديه الى انخفاض مستوى التباين في تقدير مدى السيطرة على المرض. **الخلاصة:** الإعتماد علي الحكم السريري قد يؤدي إلى عدم الدقه في تقدير مدى السيطرة على المرض. بما أن قرارات العلاج تعتمد على تصور نسبة السيطرة على المرض، هذا التباين يمكن ان يؤدى إلى قصور في تقديم العلاج و بالتالي إلى عدم السيطرة الكاملة على المرض.

مفتاح الكلمات: السيطره على مرض الربو، علاج الربو، الأطباء، العلاج، عمان

ABSTRACT: ***Objectives:*** Asthma control is often difficult to measure. The aim of this study was to compare physicians' personal clinical assessments of asthma control with the Global Initiative for Asthma (GINA) scoring. ***Methods:*** Physicians in the adult pulmonary clinics of a tertiary hospital in Oman first documented their subjective judgment of asthma control on 157 consecutive patients. Immediately after that and in the same *proforma*, they selected the individual components from the GINA asthma control table as applicable to each patient. ***Results:*** The same classification of asthma control was achieved by physicians' clinical judgment and GINA classification in 106 cases (67.5%). In the other 32.5% (n = 51), the degree of control by clinical judgment was one level higher than the GINA classification. The agreement was higher for the pulmonologists (72%) as compared to non-pulmonologists (47%; *P* = 0.009). Physicians classified 76 patients (48.4%) as well-controlled by clinical judgment compared to 48 (30.6%) using GINA criteria (*P* <0.001). Conversely, they classified 34 patients (21.7%) as uncontrolled as compared to 57 (36.3%) by GINA criteria (*P* <0.001). In the 28 patients who were clinically judged as well-controlled but, by GINA criteria, were only partially controlled, low peak expiratory flow rate (PEFR) (46.7%) and limitation of activity (21.4%) were the most frequent parameters for downgrading the level of control. ***Conclusion:*** Using clinical judgment, physicians overestimated the level of asthma control and underestimated the uncontrolled disease. Since management decisions are based on the perceived level of control, this could potentially lead to under-treatment and therefore sub-optimal asthma control.

Keywords: Asthma control; Asthma management; Physicians; Treatment; Oman.

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Advances in knowledge

- *Subjective clinical judgment alone is likely to overestimate the degree of asthma control when compared to a guideline-based classification.*
- *Overestimation of control often leads to under-treatment and the patients remain symptomatic.*
- *This study highlights the need to adhere to the standard asthma management guidelines.*

Application to Patient Care

- *Control of asthma symptoms has to be properly assessed to prescribe appropriate medications.*
- *Objective assessment tools have to be used in all situations to assess control properly.*

Asthma management is based on regular follow-up for assessment and treatment to achieve maximal control. Although complete asthma control is possible in the majority of patients using the available therapies, worldwide studies have repeatedly shown that complete control is only achieved in a small number of patients.[1–5] This has been attributed to many factors related to both health care providers and patients.[4,6–8] Factors linked to health care providers include poor follow-up and instructions, incomplete and often subjective assessment, poor knowledge of inhaler technique, and underestimation of disease severity leading to inadequate treatment. For their part, patients do not often comply well with the treatment, have an inadequate inhaler technique, or perceive the level of their asthma control inaccurately. The lack of standardised definitions for asthma control, and the discrepancy in assessments between the patients and their physicians are also important contributory factors to the reported poor asthma control.[9]

Management guidelines recommend a composite score including the presence of symptoms, need for rescue medications, limitation of activity, objective measurements, and the patient's history of exacerbations.[10] However, many physicians are not aware of the practice guidelines.[11,12] By and large, they use subjective measures to assess asthma control which are often individualised and may not truly reflect the clinical severity of the disease.[13,14] Specialists tend to supplement their assessment with objective measures like forced expiratory volume in one second (FEV1) or peak expiratory flow rate (PEFR) compared to general practitioners who use PEFR measurements infrequently.[15] In this study, we compared physicians' subjective judgment of asthma control with the categorisation of control recommended in the Global Initiative for Asthma (GINA) guidelines.

Methods

All consecutive patients with asthma followed up in the adult pulmonary clinics of Sultan Qaboos University Hospital (SQUH), Muscat, Oman, during a three-month period (October–December 2010) were prospectively evaluated using a structured assessment protocol. The project was approved by the Ethics Committee of Sultan Qaboos University. The diagnosis of asthma was made by the physician on the basis of a typical history of wheezing breathlessness, recurrent exacerbations, spirometric results, PEFR variability, and previous response to asthma medications. A positive family history, serum total immunoglobulin E (IgE), and skin tests were also considered. Being a tertiary teaching hospital, the patients at SQUH were seen by physicians with experience ranging from consultant pulmonologists to the newly recruited postgraduate internal medicine residents.

As a part of the routine assessment, physicians rated the individual patients' levels of asthma control to decide on that day's prescription. This is often entered in the clinical notes with the justification for the treatment plan, either continuing the current treatment or making appropriate adjustments in the prescription. For the purpose of this study, we requested doctors in the pulmonary clinic to complete a specifically prepared data sheet consisting of three sections: 1) the patient's demographics and the consulting physician's status (consultant, specialist or resident); 2) the consulting physician's judgment of the level of asthma control based on the overall clinical assessment; and 3) the asthma control classification table as reproduced from the GINA guidelines.[10] The doctors were not guided in the way they assessed control and were allowed to use their usual tools of assessment. After documenting their clinical judgment of the level of asthma control (by selecting one of three options

Table 1: Demographic characteristics of the patients

Characteristics		n	%
Gender	Male	54	34.4
	Female	103	65.6
Diagnosis	Asthma	51	32.5
	Asthma + Allergic Rhinitis	106	67.5
Age	<20	13	8.3
	21–40	66	42.0
	41–60	59	37.6
	>61	19	12.1
Treatment	ICS with LABA	139	88.5
	ICS without LABA	18	11.5
	Theophylline	23	14.6
	Montelukast	22	14
	Antihistaminics	87	55.4
	Nasal steroids	69	43.9

ICS = inhaled corticosteroid; LABA = long-acting beta agonist.

in the form: well controlled, partially controlled, or uncontrolled), doctors were requested to select the individual components from the GINA asthma control table as applicable to each patient without making any changes in their earlier clinical assessment. They were asked not to make any new judgments on the level of control from this selection.

The selections by the physicians on the GINA table were analysed and used to classify the level of asthma control based on GINA criteria and were then compared with those based on the clinical judgments of the physicians. The data were analysed using Statistical Package for the Social Sciences, Version 19 (IBM, Inc. Chicago, Illinois, USA). Summaries and cross tables were generated. Chi-square tests were used to test for equality of proportions and corresponding *P* values reported.

Results

A total of 157 patients (65.6% females) were evaluated. The evaluations were done by both consultant and specialist pulmonologists in 127 patients (80.9%) and the rest were evaluated by internal medicine residents. The mean age of the patients was 41.78 ± 15.18 years, the median age being 40 years. The baseline characteristics are given in Table 1. All of the patients were on inhaled corticosteroids (beclomethasone, budesonide, or fluticasone) and 139 (88.5%) were also receiving long-acting beta agonists either as a separate inhaler or in a combination device. The majority of the patients (106; 67.5%) had associated allergic rhinitis and 102 of these (96.2%) were receiving antihistamines and/or topical nasal corticosteroids.

Table 2 compares the physicians' classifications of asthma control by clinical judgment with GINA scoring. Physicians classified 76 (48.4%) patients as well-controlled, 47 (29.9%) as partially controlled, and 34 (21.7%) as uncontrolled by clinical judgment, as compared to 48 (30.6%), 52 (33.1%), and 57 (36.3%) patients, respectively, by GINA classification (P <0.001). The same classification of asthma control was achieved by clinical judgment and GINA criteria in 106 (67.5%) [Table 3]. In all the cases of discrepancy (51; 32.5%), the degree of control by clinical judgment was one level higher than the GINA classification. Of the 76 patients classified as well-controlled by clinical judgment, agreement with GINA was seen in only 48 (63.2%). The remaining 28 (36.8%) patients only met "partially controlled" GINA criteria. Even greater discrepancy was noted in the classification of patients under partial control. There was agreement with GINA for only 24 (51.1%) patients. In contrast, all the 34 patients classified as uncontrolled by clinical judgment were similarly classified using the GINA criteria. Low PEFR (46.7%) and limitation of activity (21.4%) were the most frequent parameters for downgrading the level of control by the GINA criteria in these patients [Table 4].

Table 2: Comparison of the classification of asthma control according to guideline recommendations with the physician's clinical assessment

		Controlled		Partially controlled		Uncontrolled		*P* value
		n	%	n	%	n	%	
Classification	GINA	48	30.6	52	33.1	57	36.3	<0.001
	Physicians	76	48.4	47	29.9	34	21.7	
Specialty	Specialists	62	48.8	39	30.7	26	20.5	0.746
	Non-specialists	14	46.7	8	26.7	8	26.7	

GINA = Global Initiative for Asthma.

Table 3: Distribution of physicians' clinical assessments and Global Initiative for Asthma scoring assessments

Physician Global Assessment		GINA Classification			
		Controlled	Partially controlled	Uncontrolled	**Total (n or %)**
	Controlled (n)	48	28	0	76
	(%)	63.2	36.8	0	100
	Partial (n)	0	24	23	47
	(%)	0	51.1	48.9	100
	Uncontrolled (n)	0	0	34	34
	(%)	0	0	100	100
	Total (n)	48	52	57	157
	(%)	30.6	33.1	36.3	100

GINA = Global Initiative for Asthma.

The agreement between clinical judgment and GINA classifications occurred in 72% of patients evaluated by pulmonologists as compared to 47% of patients evaluated by the non-pulmonologists (P = 0.009). Out of the 51 diagnosed with asthma alone, there was disagreement in 31% as compared to 33% in the 106 patients with asthma and allergic rhinitis (P = 0.858). Although the degree of disagreement between clinical judgment and GINA classification was higher in the older age group (41–60 years), this was not statistically significant (P = 0.378).

Discussion

This study showed that "usual" clinical judgment alone overestimates the degree of asthma control when compared to guideline-based classifications.

In all cases of discrepancy (32.5%) in the classification of asthma control, the degree of control by clinical judgment was one level higher than the GINA classification. This may lead to under-treatment and thus keep patients at sub-optimal levels of asthma control. Low PEFR and limitation of activity were the most frequent GINA parameters for downgrading the level of control, suggesting that physicians are not adequately addressing these two important elements of control in their clinical judgment.

Table 4: Percentage of each factors in those 28 patients who were judged to be in control by physicians but found to be not so by Global Initiative for asthma scoring

Control factors	**GINA (n = 28)***	
	n	**%**
Daytime symptoms	3	10.7
Activity limitation	6	21.4
Night symptoms	0	0
Salbutamol use	3	10.7
PEFR	13	46.4
Exacerbations	5	17.9

GINA = Global Initiative for Asthma; PEFR = peak expiratory flow rate.

Asthma control has become an increasingly important focus in the management of asthma. Several instruments, like the Asthma Control Test,[16] the Asthma Quality of Life Questionnaire,[17] the Asthma Therapy Assessment Questionnaire[18] and the Asthma Control Scoring System, have been developed, tested, and validated.[16–19] In addition, most of the guidelines have similar criteria to assess asthma control. However, these tools are not always used in day-to-day practice. As a result, physicians as well as patients tend to overestimate the level of control achieved.[13,20] Molimard *et al.* report that not only the patients but also their partners and even their respiratory physicians overestimated asthma control when compared with the current guidelines.[21] Similarly, we found that when using individual clinical judgment, physicians overestimated good control and underestimated both partial and uncontrolled asthma.

In a large study on 10,428 patients, physicians' assessments of asthma control were not concordant with guideline assessments in 31% of uncontrolled patients, 13% of well-controlled patients, and 2% of totally controlled patients.[2] Our physicians identified only 60% of the uncontrolled patients. Since management decisions are based on judgment of the level of control, the misclassified patient may

not receive adequate treatment and therefore will remain uncontrolled. Our physicians accepted a rating of "well-controlled" in 37% of patients who were only partially controlled on the basis of GINA guidelines, indicating that they might have made no changes in the treatment, or even stepped it down instead of stepping it up to achieve complete control.

As expected, the degree of agreement with GINA criteria for asthma control was significantly higher for pulmonologists as compared to non-pulmonologists. Boulet *et al.* showed that the selection of control criteria among a group of physicians was not uniform, with paediatricians more frequently making judgments based on cough, whereas pulmonologists often supplemented their judgment with objective measures such as spirometry and PEFR.[13] One might argue that even with standardised assessment tools such as GINA criteria and the Asthma Control Test, it remains unclear which combination of questions or measurements actually determines control as these tools may emphasise different aspects of the disease. For example, using GINA criteria we are measuring the control at that particular point of time whereas physicians may consider summative assessment over a longer period of time. In addition, physicians tend to use information about acute care, symptoms, and the direction that an illness is taking in order to assign treatment.[14] Our physicians might have used the severity of symptoms, clinical findings, (e.g. the extent of wheezes heard on chest auscultation), the need for frequent rescue medications, and the frequency of unscheduled emergency visits to judge the level of control. In addition, they might have used their views and experience to judge the maximum amount of control that could be achieved in an individual patient based on assessments made in previous visits. Moreover, patients' answers as to how they are faring could also have influenced their assessment of control. It is known that the physicians often consider patient-centred concerns in making treatment decisions.[14] However, studies have shown that clinicians' assessments of asthma control which are made without a specific objective tool perform poorly.[22] At the same time, documentation of clinical assessment has been found to be low among physicians.[23]

One limitation in our study could be a bias in assessing control by clinical judgment during the latter part of the study period, as repeated exposure to the GINA table of the control parameters might have improved the physicians' independent clinical judgments.

Our findings indicate that subjective clinical judgment alone tends to overestimate the level of asthma control, which could lead to under-treatment and leaving the patients with poor asthma control. These findings highlight the need to encourage adherence to standard management guidelines which emphasise the use of objective assessment in asthma management.

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