Comparison of doctor and patient assessments of asthma control

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Introduction

The objective of asthma management is to control the condition. However, world-wide surveys reveal that only 5% of asthmatics are well controlled. One reason for this phenomenon is the fact that patients and doctors consistently over-estimate control. This study compared patient and doctor assessment of asthma control.

Methods

A random sample of asthmatics was identified by practitioners in South Africa. Patients completed an Asthma Control Test (ACT) and provided a list of medications currently being taken. The doctor also provided an assessment of control which was summarised into the categories - 'not controlled' and 'controlled' and listed all medications prescribed.

Results

The mean ACT score was 12.8 where doctors assessed the patients as being ‘not controlled’ and 20.7 where doctors assessed the patients as being ‘controlled’. Half of the patients classified themselves as being ‘not controlled’ (ACT score <20, category 1), while doctors classified only 33% of patients as being ‘not controlled’. Although only 7% of patients disagreed with the doctor’s classification of ‘not controlled’, 29% disagreed with the doctor’s assessment of being ‘controlled’. There was a significant difference in ACT score between the sexes ($p<0.0001$). Most therapeutic interventions (with the exception of combination products [ICS+LABA]) performed poorly with regard to level of control.

Conclusion

This study suggests that asthma still appears to be relatively poorly controlled in South Africa, although levels of patient control appear to have improved compared to previous surveys, and confirms that physicians and patients differ in their assessments of asthma control.

Article Outline

Introduction

Asthma is a common disease (1), with considerable morbidity and appreciable mortality. The objective of management is to control the condition in order to enable the sufferer to live a life free from symptoms and exacerbations (2,3).

Some of the issues were highlighted in an important study in Britain in 1992. That study, known as the Lifestyle Study (4), was one of the first large studies to focus on quality of life, which has now become an important concept in chronic illnesses. The Lifestyle Study revealed the significant impact of asthma (even so called “treated” asthma) on the lives of individuals with the condition. Further asthma-related quality of life studies and assessments of asthma control have been numerous (5-9). They reflect a dismal picture of asthma control around the world with only 5% of asthmatics meeting the objective of control (10). Reasons for this phenomenon are many but include the fact that “patients and doctors consistently under-estimate severity and control (10)”.

The Asthma Insights and Reality in Europe (AIRE) survey (5) assessed the level of asthma control, among current asthmatics in Western Europe, from the patient's

perspective. Over one-third of children and half of the adults reported daytime symptoms at least once a week. Furthermore 28% of children and 30.5% of adults experienced asthma-related sleep disturbances at least once a week. Patient perception of asthma control did not match their symptoms severity, as approximately 50% of those reporting severe persistent symptoms considered their asthma to be completely or well controlled. Subsequent and recent studies have revealed that uncontrolled asthma occurred in between 49 % (11) and 53% (12) of asthmatics in Europe and Canada respectively.

Many studies of this nature have suggested that patients and their doctors disagree as to the level of control of asthma with physicians consistently over-estimating control (13). This has led to strategies relying on patient assessments of control in guiding therapy adjustments. In addition, the social cost of asthma and impact on health-related quality of life will have a direct monetary cost, adding to the cost of medication and consultations.

Many methods for assessing asthma control have been suggested (including patient questionnaires, spirometry, measures of airway hyper-responsiveness and exhaled nitric oxide), however, for the purposes of this study the 'gold standard' for assessing asthma control used was the ACT test. This test has been validated for this purpose (14). The ACT was then compared to clinicians assessment, as would be done in the real world situation. Doctor assessment in determining asthma control is an imprecise science and despite recommendations in asthma guidelines there is little clear evidence for which questions or combination of questions actually determine control. There is evidence that a standardised questionnaire is better than conventional history taking. The GOAL Study authors attempted to resolve this problem with the Asthma Control Questionnaire (15). In this study the authors used patients symptoms and PEFR over time to assess control and found reasonable robust cut-points. Also quite interestingly the positive and negative predictive values for assessment using the various cut points did not change significantly when FEV1 was omitted. This suggests that spirometry does not add significantly in determining asthma control (15).

This study addresses comparisons between patient and doctor reported asthma control in South Africa in general, and with respect to different medical practice types (private versus public and generalist versus specialist). Documentation of the relationship between the level of control and medication being used was also noted.

The aim of this study was to compare the relative efficacy of patient perception obtained by means of a standardised questionnaire, the ACT, with that of the doctor's assessment of asthma control.

Methods

A random sample of asthmatics was identified by medical practitioners in multiple regions of South Africa. Doctors participating were selected from the Medical Association Data Base. Attempts were made to design the study so as to represent most medical practice types. This was performed in order to obtain data for patients from public and private medical facilities, and to include a range of doctor qualifications: Urban General Practitioner (GPU), Community Health Clinic (CHC), Academic Hospital Respiratory Clinic (RCH) and Specialist Private Pulmonologist (SPP). Each patient selected was a known asthmatic who was being seen for a routine follow-up visit. Patients presenting with acute asthma were excluded.

The study was conducted prospectively and both patients and doctors were informed that they were taking part in a clinical study. Patients completed a self-evaluation rating (ACT) as a measure of their level of asthma control and provided a list of medications currently being taken. The doctor also provided a blinded assessment of the same patient's level of control using the categories – 'not well controlled', 'well controlled' and 'totally controlled' and listed all medications prescribed. The categories 'well controlled' and 'totally controlled' were combined for ease of assessment. These categories will be referred to as 'not controlled' and 'controlled'. Doctors were not guided in the way they assessed control. Each practitioner was instructed to use his usual tools of assessment. These may have included history taking, examination, spirometry and/or measures of airway inflammation. The gender of the patient, their city of residence, the type of practice and the area in which the site fell, were also recorded.

The ACT score was analysed and in addition was coded into three sets of categories as described in the original study (14): Category 1 (ACT score 1-19), Category 2 (ACT score 20-24) and Category 3 (ACT score 25). This facilitated comparison of the patient self-categorisation with the doctor's classification of 'not well controlled', 'well controlled' and 'totally controlled'. For ease of interpretation this paper generally discusses the analysis with Categories 2 and 3 combined as total asthma control may reflect too narrow an assessment band. Good (well or totally controlled) control may be an acceptable level of asthma control.

Medications listed were classified into standard groups.

Ethics Committee consent was obtained for this study and patient informed consent was obtained.

Statistical methodology

Association between the patient's self-assessed ACT score, and the doctor's assessment of control ('not well controlled', 'well controlled', and 'totally controlled') was tested using the Kruskal-Wallis analysis of variance test. Where a significant difference was found ($p<0.05$), follow-up Mann-Whitney U tests were performed, at a Bonferroni adjusted significance level.

Comparison of the measures of control and the grouped ACT categories was performed using a $\chi 2$ contingency table test and Cohen's Kappa.

The relationship between the patient and doctors assessment as to the level of control against demographic variables and medication types was determined using logistic regression. The demographic variables investigated were the combination of practice type city of residence, and gender. Treatment types investigated were the type of medication, and, where a combined medication was prescribed, a test for differences between Salmeterol/Fluticasone and Formoterol/Budesonide. All interactions between these variables were investigated.

All analyses were performed using SPSS® (16).

Results

Comparison of patient recorded asthma control (ACT) with doctor assessment of control

Significant association existed between the full ACT score and the doctor's assessment of control, with the median ACT scores increasing over the three categories of doctor assessments (overall and pair-wise tests, $p< 0.0001$). The mean ACT score was 12.8 where doctors assessed the patients as being 'not controlled' and 19.9 where doctors assessed the patients as being 'well controlled' (Table 1). The mean ACT score was 20.7 when the ACT scores for 'well controlled' and 'total control' were added together as

'controlled'. Half of the patients classified themselves as being 'not controlled' (ACT score <20, category 1), while doctors classified only 33% of patients as being 'not controlled'. Although only 7% of patients disagreed with the doctor's classification of 'not controlled', 29.2% disagreed with the doctor's assessment of being 'controlled'.

Patient (ACT) and doctor assessed control by practice type, gender and medication use (logistic regression)

Assessments of asthma control (both by patient (ACT categories) and doctors) were significantly different between the practice types ($p<0.0001$ for both patient and doctor). Specialist Private Pulmonologists demonstrated the highest assessments of control. For those patients at an Academic Hospital Respiratory Clinic (RCH) the odds of being controlled were 0.303 for patient assessments and 0.225 for doctor assessments compared to being controlled if asthma was assessed by a Specialist Private Pulmonologist. There was also a significant gender difference ($p<0.0001$) for patient assessments but not for doctor assessments ($p=0.0618$). Median ACT score for females was 18, and for males 20. Overall 59.4% of males assessed their asthma control as being 'controlled' (20 or higher) versus only 43.7% of females. The practice type, gender and medication combinations are shown in Table 2 (patient assessment) and Table 3 (doctor assessment), which give the number of patients in each category, row percentage, p value, odds ratio (OR) and 95% confidence interval for the OR.

For both patient assessed and doctor assessed levels of control, there was a significant difference between the types of medication ($p<0.0001$, $p=0.0001$). For patient assessment (ACT score) the use of combined ICS/LABA was associated with significantly better scores than the other 3 groups (no ICS: $p=0.0103$, ICS: $p=0.0004$, separate: $p<0.0001$) but the scores for the other medication groups did not differ significantly from each other. For doctor assessed control the reported use of combined ICS/LABA was associated with significantly better assessments than ICS/LABA separate ($p=<0.0001$), but did not differ significantly from the other two groups (no ICS: $p=0.1084$, ICS: $p=0.0504$). After controlling for the other factors, the odds, (chance of being controlled), for those patients on separate ICS/LABA was 0.34 that of being controlled when on combined ICS/LABA. Alternatively patients were 2.94 times more likely to be controlled if they were on combined ICS/LABA than on separate ICS/LABA, according to the doctors classification.

Use of ICS/LABA separate was associated with significantly worse assessment of control than ICS ($p=0.0005$) and no ICS ($p=0.0079$).

In addition the study could identify the level of agreement between patient and doctor disclosed medication use. Doctors and patients agreed in 91.9% of cases, but disagreed in 8.1% of cases. In addition no significant difference was found between the individual combination agents (fluticasone + salmeterol and budesonide + formoterol) for the ACT categorisation ($p = 0.8399$) or for the doctor assessed rating ($p = 0.3690$).

Discussion

A strength of this study is the relatively large number of patient and doctor pairs studied. This study suggests that asthma still appears to be poorly controlled in South Africa. A significant number of patients (50%) being treated for asthma identified their control, as measured by the ACT, as being 'uncontrolled'. However, this has significantly improved in contrast to a previous survey, where only 6 – 8% of treated asthmatics were considered to be well controlled (8). This study also reveals that doctors and patients differ on individual assessments of asthma control. Doctors classified 39% of patients who assessed their own control as ACT category 1 ('not controlled') to be 'well and totally controlled'. This 'overestimation' is, however, well known from previous studies (13). Levy and colleagues found very similar disagreements with 59% of patients indicating uncontrolled asthma while physicians regard only 42% of patients as uncontrolled (13). It should be remembered that because doctors were not guided in the way they assessed control, there is a possibility of classification errors which may influence the results.

Patients on the other hand seldom overestimated control, in contrast to their doctor's assessment of their control. It is important to repeat this audit to determine whether the patient's knowledge of lack of control leads to a change in medication prescription and management strategies by doctors to achieve better control. This was not addressed in this study.

This study highlights some important issues with respect to level of care for asthmatics as well as therapy selection to achieve control. Specialist Private Pulmonologists appeared to perform better than all other groups of doctors in achieving asthma control in their patients, at least as indicated by patient ACT results.

The level of control can be expected to vary to a great extent between primary care and tertiary care. This finding may however, reflect the specific nature of the population group treated by this group of doctors. A number of confounding variables are possible including

medication access and socio-economic factors. This may be especially true of the group of patients attending Academic Hospital Respiratory Clinics, and Community Health Clinics where medication access is limited. Increased consultation with pulmonologists should be made for those patients assessed as being uncontrolled, by themselves or by their general practitioner. This phenomenon should be borne in mind in planning health resources, even in resource-poor settings, if the goal of asthma management is to achieve control.

Secondly the gender discrepancies are interesting. No previous study has identified major differences between sexes with respect to asthma control (17-19). In this study males appeared to be better controlled than females. Our study was not able to suggest a reason for this.

In general the study suggests that patients generally know what medication they are using. There is a good correlation between patient recall of their medication and that noted by their doctor. This phenomenon may have special relevance to asthma control as understanding should aid in adherence. Measures of adherence were not directly measured in this study but it was noted that the vast majority were prescribed ICS with which they were familiar. Interestingly only patients treated with a combination product (ICS + LABA) have significantly better asthma control. Lack of asthma control, as rated by the doctor, for the combination of ICS/LABA in separate containers is surprising and needs to be explored. Numerous studies have shown that combined ICS and LABA achieve better control (19-21). Perhaps the lack of use of an ICS/LABA combination in the majority of patient's is a major factor in their lack of control. All other therapeutic combinations performed poorly at the level of asthma control. It should be remembered that this finding, whilst interesting, should ideally be substantiated by randomised clinical trial as the demographic data and severity of asthma of the patient population is not adjusted for.

Actual degree of asthma severity has not been elicited in this study and many overlapping factors may confound attempts to unravel the phenomenon of lack of control. However, it should be remembered that this is a large study of asthma control with many patient groups and practice types (from general practitioners to private pulmonologists) being represented. It is unlikely that only more severe asthmatics are being studied. Therefore, this study highlights an important observation about asthma control that should be noted and digested by all stakeholders in South Africa.

This study suggests one method of determining asthma control, namely ACT score. However what is still unclear is how measurement of asthma control is most effectively

performed. Each of the conventional tools for doing this have both their proponents and detractors and evidence for and against reliability and validity (11,22). Most previous studies have shown that clinician assessment of asthma control, without a specific objective tool perform poorly, and hence the need to find a more sensitive marker of control (12). This study does not address the issue of verifying the asthma control assessments and the relevance of such assessment in the overall control of patients with asthma.

Conclusion

Asthma remains relatively poorly controlled in South Africa although the level of control has improved in contrast to that previously noted. Control is better achieved by Specilaist Private Pulmonologists in contrast to all other practitioner groups. Patients have a different perception of their level of control than their doctor. Inexplicably males appear to be better controlled than females. Those patients on combination therapy of an ICS and LABA are best controlled whilst those not on a LABA in addition to an ICS are less well controlled.

With the recent publication of new asthma guidelines there is a certain degree of optimism that attempting to correct the deficiencies of asthma management of the past may finally be possible. Return to normal life is now the clear goal of asthma treatment.

This study suggests that physicians and patients may be capable of assessing asthma control with the various tools at their disposal but that action on this information to improve control is needed. This study demonstrates that there is an opportunity for intervention by doctors to control asthma better with education remaining a priority.

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Conflict of Interest Statement

Dr Michael Greenblatt has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline. Dr Jacky Galpin declares no conflict of interest. Ms Cindy Hill declares no conflict of interest. Dr Charles Feldman has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: Altana, AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, MSD and Pfizer. Dr Robin Green has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: Altana, AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, MSD and Pfizer.

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Table 1.

a) Number of observations for patient assessed asthma control (ACT) (percentage) compared to doctor assessed level of control.

	Mean/Median*	ACT score			
Doctor assessed control		**0-19**	**20-24**	**25**	**Total**
Not controlled	12.8/12	391(92.9)	27(6.4)	3(0.7)	421
Well controlled	19.9/20	216(36.3)	357(60)	22(3.7)	595
Total control	22.6/24	34(13.1)	142(54.6)	84(32.3)	260
Total		641	526	89	1276

* Mean/median reflects the mean/median of the ACT scores in the three groups of doctor assessed control (Not controlled, Total Control)

ACT = Asthma Control Test

b) Number of observations for patient assessed asthma control (ACT) (percentage) compared to doctor assessed level of control, combining well and total control.

	Mean/Median*	ACT score		
Doctor assessed control		**0-19**	**20-25**	**Total**
Not controlled	12.8/12	391(92.9)	30(7.1)	421
Well or Total controlled	20.7/21	250(29.2)	605(70.8)	595
Total		641	635	1276

* Mean/median reflects the mean/median of the ACT scores in the two groups of doctor assessed control (Not controlled and Controlled)

ACT = Asthma Control Test

Table 2.

Comparison of patient assessed level of asthma control over the medication groups as recorded by the doctor, after adjusting for practice type and sex (numbers of observations, row percentage, significance, odds ratio and the 95% confidence interval for the odds ratio).

	Patient assessed control (ACT category)								
	1 (<20)	%	2+3 (20-25)	%	Total	p	OR	95% confidence interval	
Practice						<0.0001			
GPU	69	46.3	80	53.7	149	0.0003	0.545	0.3925	0.7577
CHC	128	74.9	43	25.1	171	0.1808	0.765	0.5169	1.1325
RCH	257	61.0	164	39.0	421	<0.0001	0.303	0.1929	0.4746
SPP	182	35.0	338	65.0	520	-	-	-	-
Sex						<0.0001			
Male	199	40.8	289	59.2	488	<0.0001	1.665	1.3059	2.1232
Female	437	56.5	336	43.5	773	-	-	-	-
Medication group						0.0001			
no ICS	76	55.9	60	44.1	136	0.0002	0.534	0.3841	0.7424
ICS	327	60.1	217	39.9	544	0.0072	0.556	0.3621	0.8527
ICS/LABA separate	89	65.4	47	34.6	136	0.0001	0.389	0.2449	0.6177
Combined ICS/LABA	144	32.4	301	67.6	445	-	-	-	-
Total	636	50.4	625	49.6	1261				

Abbreviations: Community Health Clinic (CHC); Academic Hospital Respiratory Clinic (RCH); Urban General Practitioner (GPU); Specialist Private Pulmonologist (SPP), Inhaled corticosteroid (ICS) (without other drugs except SABA); Long-acting beta-agonist (LABA)

Table 3.

Comparison of doctor assessed level of asthma control over the medication groups as recorded by the doctor, after adjusting for practice type and sex (numbers of observations, row percentage, significance, odds ratio and the 95th confidence interval for the odds ratio).

	Doctor assessed category								
	Not controlled		Controlled		Total	p	OR	95% confidence interval	
Practice						<0.0001			
GPU	49	32.9	100	67.1	149	0.0004	0.526	0.3682	0.7521
CHC	98	57.3	73	42.7	171	0.0072	0.558	0.3647	0.8538
RCH	169	40.1	252	59.9	421	<0.0001	0.225	0.1452	0.3497
SPP	103	19.8	417	80.2	520	-	-	-	-
Sex						0.0618			
Male	135	27.7	353	72.3	488	0.0618	1.282	0.9878	1.6631
Female	284	36.7	489	62.3	773	-	-	-	-
Medication group						0.0001			
no ICS	50	36.8	86	63.2	136	0.0573	0.701	0.4856	1.0111
ICS	213	39.2	331	60.8	544	0.1192	0.692	0.4351	1.0996
ICS/LABA separate	70	51.5	66	48.5	136	<0.0001	0.340	0.2115	0.5454
Combined ICS/LABA	86	19.3	359	80.7	445	-	-	-	-
Total	419	33.2	842	66.8	1261				

Abbreviations: Community Health Clinic (CHC); Academic Hospital Respiratory Clinic (RCH); Urban General Practitioner (GPU); Specialist Private Pulmonologist (SPP), Inhaled corticosteroid (ICS); Long-acting beta-agonist (LABA)