Evaluation of the treatment provided to patients with asthma by the Brazilian Unified Health Care System*

Avaliação da assistência ao paciente asmático no Sistema Único de Saúde

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Abstract

Objective: To determine, based on international guidelines for asthma management, the appropriateness of the treatment that the Unified Health Care System provides to patients with asthma. **Methods:** This was a cross-sectional study involving patients suspected of having asthma and referred to the Pulmonology Clinic of the Federal University of Minas Gerais *Hospital das Clínicas*, Brazil, between November of 2006 and October of 2007. **Results:** A total of 102 patients were included, and 70 were diagnosed with asthma. The previous treatment was consistent with the guidelines in 18.6% of the patients; 50.0% of the patients had previously been submitted to spirometry, and 34.3% had previously been submitted to PEF. The most frequently prescribed medication was short-acting β_2 agonists (90.3%). **Conclusions:** The results show that the majority of non-specialized physicians working within the public health care system do not manage the treatment of patients with asthma in accordance with the guidelines. This situation calls for continuing medical education programs that prioritize primary care.

Keywords: Asthma; Guideline adherence; Therapeutics; Public health.

Resumo

Objetivo: Verificar a adequação da assistência médica prestada a pacientes asmáticos do Sistema Único de Saúde de acordo com diretrizes internacionais para o manejo da asma. **Métodos:** Estudo transversal, incluindo pacientes com suspeita de asma e encaminhados para o Serviço de Pneumologia do Hospital das Clínicas da Universidade Federal de Minas Gerais entre novembro de 2006 e outubro de 2007. **Resultados:** Foram incluídos 102 pacientes, e 70 confirmados como asmáticos. A assistência médica anterior foi considerada adequada em 18,6% dos pacientes; 50,0% dos asmáticos já haviam realizado espirometria previamente e 34,3%, manobra de PFE. A medicação mais utilizada foi o β_2-agonista de curta duração (90,3%). **Conclusões:** Os resultados indicam que o manejo de pacientes asmáticos pela maioria dos médicos não-especialistas do sistema público de saúde está em desacordo com as diretrizes, sendo necessários programas de educação médica continuada, priorizando o nível de atenção primária.

Descritores: Asma; Fidelidade a diretrizes; Terapêutica; Saúde pública.

Introduction

Asthma is a chronic inflammatory airway disease with a prevalence rate of 2-26% in Brazil and Latin America, which has a significant impact in terms of morbidity, quality of life and resources expended on its treatment, especially in cases in which the disease is poorly controlled.[1] In Brazil, asthma is the fourth leading cause of hospitalization under the Unified Health Care System, accounting for 329,182 hospital admissions in 2004.[2]

The efficiency that anti-inflammatory treatment administered through inhalation has on asthma control is well established,[3,4] this treatment being universally recommended in the various existing guidelines for the treatment of asthma. However, in Brazil, access to this treat-

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Financial support: None.
Submitted: 26 November 2008. Accepted, after review: 10 February 2009.

ment modality has been impaired due to the limited earning power of patients, to the fact that the public health care system does not provide free medication and to patient noncompliance with treatment.[5-7] In addition to these factors, studies have revealed that physician failure to follow the guidelines for the diagnosis and treatment of asthma contributes significantly to a lack of disease control.[8-12]

The objective of the present study was to determine the appropriateness of the treatment that the public health care system provides to adult patients with asthma. Patients referred to the Pulmonology and Thoracic Surgery Clinic of the *Hospital das Clínicas da Universidade Federal de Minas Gerais* (HC/UFMG, Federal University of Minas Gerais *Hospital das Clínicas*), located in the city of Belo Horizonte, Brazil, for a first medical appointment were evaluated using international guidelines for asthma management.[12]

Methods

We included patients (aged 18 years or older) suspected of having asthma and referred from the Belo Horizonte municipal health system to the HC/UFMG Pulmonology Outpatient Clinic for a first medical appointment. Consecutive patients were included between November of 2006 and October of 2007. We applied a questionnaire specifically developed for this project. This questionnaire comprised 98 items designed to collect social, demographic and economic data, as well as data related to clinical variables that are currently used in the evaluation of disease control. In addition, the questionnaire comprised questions regarding the following: duration of symptoms; medical treatment previously provided; the initial assessment; triggering factors; family history; previously prescribed medication; quantity of information received regarding the disease and its treatment; previous functional data; results of the spirometric tests performed at the clinic; and the final diagnosis. In order to determine the appropriateness of the treatment previously provided to the patients, the 2006 Global Initiative for Asthma (GINA) guidelines were used as a reference.[12] The pulmonary function tests routinely performed at the clinic were conducted in accordance with the Brazilian Pulmonary Function Test Guidelines established by the Brazilian Thoracic Association, without any interference from the researchers. The results were collected from the medical charts by the researchers, as were the results of the final diagnosis made by the attending physicians. The exclusion criteria were having been referred for the treatment of a clinical condition other than asthma, being unable to respond to the questions due to a cognitive deficit and having an acute severe attack that remained unresolved at the time of the interview.

The research project was approved by the UFMG Research Ethics Committee. All participating patients gave written informed consent.

Categorical variables are presented as mean, range and standard deviation, when applicable. Proportions were compared using the chi-square test. McNemar's test was used to compare the working diagnosis in the first medical appointment with the final diagnosis of the case, taking into consideration the interdependence of the results obtained for a given patient. The statistical tests were performed using the Minitab software program, version 14 (Minitab Inc., State College, MA, USA), considering a 95% confidence interval and an α value of 0.05.

Results

The sample comprised 102 patients, 70 (68.6%) of whom were diagnosed with asthma and 7 (6.9%) of whom were diagnosed with other diseases. Of those 102 patients, 24 (23.5%) did not attend subsequent medical appointments until the end of the study and were designated "diagnosis not confirmed"; 1 patient did not complete the questionnaire and was excluded from the study. Therefore, the final sample consisted of 70 patients with asthma and 7 patients with other diseases. The mean age of the patients with asthma was 47.6 years; most had little schooling and a family income of less than three times the national minimum wage (Table 1).

Among the patients with asthma, 33 (47.1%) had previously had a medical appointment with a pulmonologist, on average, 4 years prior, and most had been referred by a general practitioner (Table 1). Half of the patients with asthma had previously been submitted to spirometry, and 24 (34.3%) had previously been submitted to the PEF maneuver. As shown in Figure 1, the medications most frequently prescribed by the physicians previously consulted were short-acting

Table 1 - General characteristics of the patients (n = 101).

Variable	With asthma (n = 70)	Without asthma (n = 7)	Lost to follow-up (n = 24)	p
Mean age, years	47.6 ± 17.3 (15-83)	59.6 ± 7.3 (50-68)	43.9 ± 16.4 (14-71)	0.095
Female gender	53 (75.7)	6 (85.7)	17 (70.8)	0.715
Schooling				
0-3 years	22 (31.4)	4 (57.1)	10 (41.6)	***
4-7 years	26 (37.2)	3 (42.9)	7 (29.2)	
8-10 years	11 (15.7)		3 (12.5)	
≥ 11 years	11 (15.7)		4 (16.7)	
Profession				
Homemaker	13 (18.8)	4 (57.1)	4 (16.7)	***
Maid/cleaner	10 (14.3)		3 (12.5)	
Student	6 (8.6)		3 (12.5)	
Seamstress	3 (4.2)		2 (8.3)	
Other	38 (54.3)	3 (42.9)	12 (50.0)	
Employment status				
Employed	48(68.6)	5 (71.4)	17 (70.8)	***
Unemployed	7 (10.0)		3 (12.5)	
Retired	13 (18.6)	2 (28.6)	3 (12.5)	
On leave of absence	2 (2.8)		1 (4.2)	
Family income				
< 1 times the MW	6 (8.6)		3 (12.5)	***
1-3 times the MW	59 (84.3)	7 (100)	20 (83.3)	
> 3 times the MW	5 (7.1)		1 (4.2)	
Current smoking				
Yes	22 (31.4)	5 (71.4)	6 (25.0)	0.065
No	48 (68.6)	2 (28.6)	18 (75.0)	
PEF (% of predicted)	64.2 ± 27.3 (0-120)	62.7 ± 38.9 (0-116)	73.9 ± 18.9 (43-92)	0.341
FEV_1/FVC	64.5 ± 14.0 (33.3-94.2)	65.8 ± 10.5 (53.1-79.9)	77.9 ± 5.0 (69.0-84.3)	0.024*
FEV_1 (% of predicted)	70.2 ± 23.5 (16-120)	53.6 ± 22.2 (34-96)	86.5 ± 14.6 (66-100)	0.040**
Original physician specialty				***
General clinical medicine	52 (74.3)	3 (42.8)	19 (79.2)	
Otolaryngology	1 (1.4)			
Pulmonology	2 (2.9)	1 (14.3)		
Cardiology		1 (14.3)	2 (8.3)	
Other	15 (21.4)	2 (28.6)	3 (12.5)	
Duration of symptoms (years)	19.4 ± 18.3 (0.1-80)	12.1 ± 11.6 (2-35)	13.5 ± 13.7 (0.1-50)	0.339
Previous pulmonology consult	33 (47.1)	5 (71.4)	9 (37.5)	0.281
Time since previous consult (years)	4.0 ± 5.5 (0.1-30)	1.4 ± 1.4 (0.1-3)	3.5 ± 3.5 (1-10)	0.248
Prior diagnosis of asthma	68 (97.1)	7 (100)	22 (91.6)	***

MW: (national) minimum wage. Data are presented as n (%) or mean ± SD (range). *Patients with asthma *vs.* patients lost to follow-up ($p < 0.05$). **Patients without asthma *vs.* patients lost to follow-up ($p < 0.05$). ***Statistical comparison not possible.

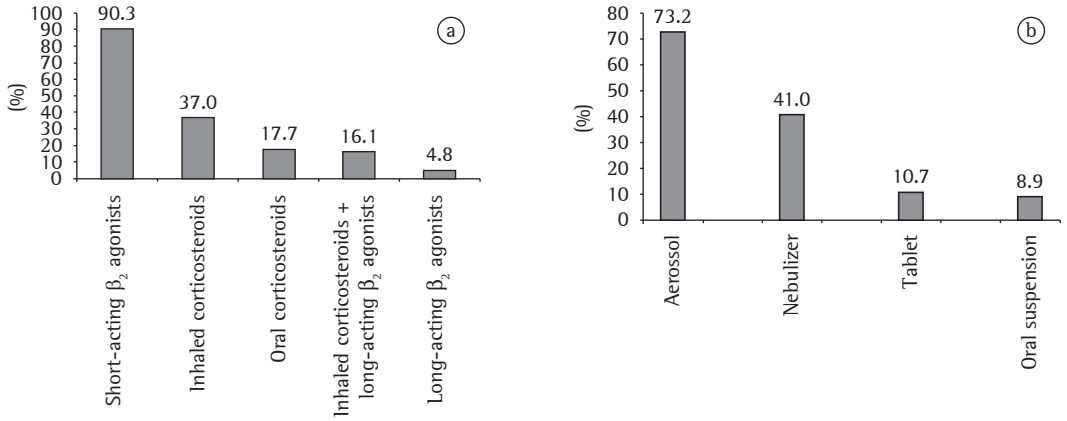

Figure 1 - In a, medications that the patients were using at the time of the first medical appointment; in b, pharmaceutical forms (n = 62).

β_2 agonists (in 98.5%), oral corticosteroids (in 63.8%) and inhaled corticosteroids (in 47.8%).

Of the 70 asthma patients in our sample, 62 (88.5%) were using asthma medication at the time of the first medical appointment. Of those, 90.3% were using short-acting β_2 agonists, 37% were using inhaled corticosteroids, 17.7% were using oral corticosteroids and 16.1% were using a combination of long-acting β_2 agonists and inhaled corticosteroids (Figure 1).

Of the 70 patients with asthma, 15 (21.4%) reported having previously received information regarding the disease, and only 32 (45.7%) reported having been instructed in how to deal with asthma attacks (Table 2). As can be seen in Table 3, 49 (70.0%) of the asthma patients had sought emergency room treatment in the last year (mean, 6.9 visits). Those same patients presented high weekly mean values for diurnal symptoms, nocturnal symptoms and use of β_2 agonists for symptom relief, together with high work and school absenteeism due to lack of disease control.

The technique for the use of the inhaler was considered correct in 36 (50.8%) of the patients with asthma, although 59 (84.6%) had been instructed in how to use it.

The treatment previously received was considered consistent with the GINA guidelines in 13 (18.6%) of the asthma patients. The treatment was consistent with the guidelines in 24.2% of those who had previously had an appointment with a pulmonologist and in 13.5% of those who had never had an appointment with a specialist (p = 0.249; Figure 2). The comparison of the classification of severity made in the first medical appointment with that made in the subsequent medical appointments revealed that there was a significant change in this classification (p = 0.002).

Discussion

The present study showed that, in general, the assessment and treatment provided to the patients in our sample by non-specialized physicians working within the public health care system were not in accordance with the guidelines for the diagnosis and treatment of asthma. For instance, the treatment was consid-

Table 2 - Instructions received about the disease (n = 70).

Characteristic	n (%)
Having previously received information regarding the disease	
Yes	15 (21.4)
No	55 (78.6)
Information provided by	
Physician working at the health care center	7 (46.7)
Another professional	8 (53.3)
Having previously been instructed about asthma attacks	
Yes	32 (45.7)
No	38 (54.3)
Instructions provided	
Use relief medication	18 (56.3)
Seek hospital care	10 (31.2)
Others	4 (12.5)

Table 3 - Evaluation of disease control (n = 70).

Control variable	Values
Emergency room visits in the last year	
Yes	49 (70.0)
No	21 (30.0)
Number of visits	6.9 ± 14.4 (1-100)
Diurnal symptoms/week in the last month	5.4 ± 2.7 (0-7)
Nocturnal symptoms/week in the last month	3.0 ± 2.8 (0-7)
Use of short-acting β_2 agonists/ week in the last month	4.7 ± 2.6 (0-7)
Work or school absenteeism (in days) in the last year	9.7 ± 12.8 (0-60)

Values are presented as n (%) or mean ± SD (range).

ered consistent with the GINA guidelines in only 18.6% of the asthma patients, similarly to what was reported in another study, in which only 30.0% of the patients evaluated received treatment consistent with the Brazilian guidelines for asthma management.[13] The finding that most patients (97.1%) had been treated by non-specialized physicians explains, at least in part, the fact that only half of them had previously been submitted to spirometry. Similarly, approximately 34.0% of the patients had previously been submitted to the PEF maneuver. However, the treatment previously received by the patients who had had an appointment with a pulmonologist (47.1%) was not found to be superior to that received by the other patients in terms of consistency with the guidelines. This fact could be explained, in part, by the long time elapsed since the appointment with the specialist (mean, 4 years). Another group of authors evaluated 5,580 patients with asthma and found that those who were treated by specialists were more likely to have been submitted to a PEF maneuver and to have received treatment consistent with the guidelines, as well as being more likely to receive a greater quantity of information regarding prevention and how to deal with asthma attacks.[11] In the present study, only 21.4% of the patients received information regarding the disease and 45.7% received instructions on how to deal with acute asthma attacks. This can be attributed to the fact that, in most cases, the treatment had been performed by non-specialized physicians. Although the study sample predominantly comprised patients with persistent asthma (94.3%), only 53.1% were using inhaled corticosteroids, which is in contrast to current treatment guidelines. Another important observation was that 48% of the patients used long-acting β_2 agonists in isolation and that 19.6% of the patients used short-acting β_2 agonists (syrup or tablets). One group of authors observed that pulmonologists and allergists had a higher level of knowledge regarding guidelines for asthma management than did residents, graduate students and primary care physicians.[14] One study conducted in Brazil compared individuals with asthma who were treated as outpatients by specialists with those who sought emergency room treatment in the same hospital due to asthma exacerbation. Among those who were treated by general practitioners, the number of emergency room visits was higher (95.3% *vs.* 48.8%; $p < 0.001$) and the proportion of patients using the correct inhaled medication technique was lower (11.6% *vs.* 50.0%; $p < 0.001$).[6]

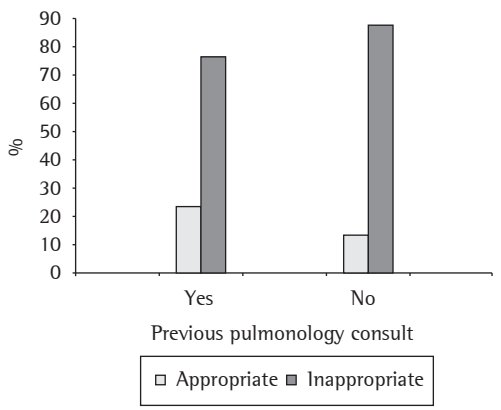

Figure 2 - Appropriateness of the treatment in terms of having had a previous appointment with a pulmonologist (p = 0.249).

In the present study, 49 (70.0%) of the asthma patients had sought emergency room treatment in the last year (mean, 6.9 visits) and 33 (50.8%) used the inhaled medication correctly. This high percentage could be attributed to the fact that there had been a previous appointment with a pulmonologist in most cases. In a study involving 1,559 patients,[5] the authors reported that the most frequently prescribed medication was short-acting β_2 agonists (71%), followed by the combination of long-acting β_2 agonists and inhaled corticosteroids (59%). Similarly, in the present study, short-acting β_2 agonists were

the medications most frequently prescribed (in 90.3%), although the combination of long-acting β_2 agonists and inhaled corticosteroids was prescribed infrequently (in 16.1%), despite the fact that 27.4% of the asthma patients in the sample had severe asthma. A study evaluating asthma management in 11 Latin-American countries obtained similar results.[15] In that study, a small proportion of the population studied used medications that were appropriate to the severity of their condition, and only 6% used inhaled corticosteroids.[15]

The present study revealed that, after the assessment, there was a significant decrease in the classification of severity, and this seems to indicate that, in fact, most of the patients had poorly controlled asthma, which can be confirmed by the high weekly mean of diurnal symptoms (5.4), nocturnal symptoms (3.0) and use of β_2 agonists as a relief medication (4.7). These data are in agreement with those presented in the study designated Asthma Insights and Reality in Latin America, in which, based on the GINA criteria, only 2.4% of the patients were found to have well-controlled asthma.[15] In addition, we should consider the low educational and economical level of our sample of patients, which might have contributed to the lack of disease control.

The main limitation of the present study was the small number of patients included. Consecutive patients referred for a first medical appointment within a one-year period were included, and this small number reflects a temporary reduction in the number of openings in the clinic at the time. Although the cross-sectional design imposes limitations on the analysis of causality, this method has been used in various investigations that aim to collect demographic and epidemiological data. In addition, 30.7% of the patients were lost to follow-up, and the data obtained were not compared with those regarding the patients who were being treated by specialists. The classification of asthma severity and asthma control was performed based on the 2006 GINA recommendations—the version available at the time of data collection.

The results of the present study, despite its limitations, underscore the fact that, in addition to the need for specific medications for asthma treatment to be made available in the public health care system, it is necessary that official programs of continuing medical education that prioritize primary care, as well as including appropriate instrumentation and training, be systematically implemented, accompanied by the dissemination of the knowledge currently made available in guidelines for asthma management.

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