

CORRELATION BETWEEN CLINICAL CLASSIFICATION, PEF AND FEV1 : GUIDELINES AND REALITY

A.-G. Palma-Carlos ⁽¹⁾, M.-L. Palma-Carlos ⁽¹⁾

Summary

The currently proposed guidelines and consensus for asthma include Peak expiratory flow (PEF) and forced expiratory volume in the first second (FEV₁) as two criteria to classify asthma severity. The report between these functional data and clinical classification degrees has been evaluated in 153 asthmatic patients. Concordance between functional evaluation and clinical degree has been found only for moderate persistent asthma but not for intermittent or mild persistent asthma. These results suggest that the correlation between clinical evaluation and lung function proposed in the guidelines must be reevaluated.

Key-words : Asthma - Guidelines - GINA - PEF - FEV1

In the last few years the Consensus and Guidelines on Asthma and Global Initiative on Asthma (GINA) have proposed a clinical classification of Asthma in different degrees of severity slightly modified in the last versions namely on 2002 revision of global strategy for asthma management and prevention (5, 6, 7, 8, 9, 10, 11).

Four levels of severity are now considered, depending on clinical features before treatment, ventilatory dysfunction global indexes PEF (peak expiratory flow) and FEV1 (forced expiratory volume) in the first second and reversibility by Beta-2 bronchodilators. Asthma severity in increasing degrees is classified as intermittent, mild persistent, moderate persistent and severe persistent. These degrees correspond to an increase in frequency and severity of dyspnea, a decrease in PEF and/or FEV1 and the degree of reversibility. In intermittent asthma PEF and FEV1 are equal or superior to 80% of predicted value, in mild persistent superior of 80%, in moderate persistent superior of 60% and inferior of 80%, and in severe persistent inferior to 60% (5, 6, 7, 8, 9, 10, 11).

Simultaneously clinical data are included in the different degrees of asthma severity but it is not clear if they are in practice frequent discrepancies between clinical evaluation and functional parameters, PEF and FEV1 (1, 2, 3, 4, 5).

The aim of this paper is to see if there are discrepancies between clinical data and functional evaluation.

MATERIAL AND METHODS

153 adult asthmatic out patients, 68 males and 85 females, have been studied in absence of bronchodilatory therapy in the days preceding the study of lung function. These patients have been classified as intermittent, mild persistent, and moderate persistent on the base of the frequency of symptoms, duration of exacerbation, and frequency of nighttime asthma symptoms, as proposed by the Guidelines on Management of Asthma (6, 7, 8, 9, 10, 11). Spirometry has been done in all the patients with a Vitalograph Compact spirometer in absence of bronchodilatory or anti-inflammatory therapy in the last few days, and Peak expiratory flow determined with a WRIGHT Peak Flow meter.

RESULTS

66 patients were considered as intermittent asthma, 61 as mild persistent and 26 as moderate persistent. No patient has been classified as severe persistent (table 1).

From the 66 patients of the intermittent asthma group, FEV₁ was decreased in 51 (77,2%) and PFR in 53

⁽¹⁾ I Medical clinic, Lisbon University Hospital and Center for Hematology and Immunology - CHIUL - Faculty of Medicine, Lisbon (Portugal).

(80,3%). In the mild persistent group (61 patients) FEV₁ was decreased in 59 (96,7) and PFR also in 59 96,7%). From the 26 patients of the moderate persistent group FEV₁ was decreased in 24 (92%) and PFR in 25 (96%). Statistical analysis show that there was significant differences between intermittent and persistent asthmas ($X^2 = 9,0$ $p < 0,01$ for FEV₁) and $X = 28,1$ $p < 0,01$ for PFR. However, there was no significant statistical differences between mild persistent and moderate persistent asthmas. For FEV₁ $X^2 = 0,12$ $p < 0,8$ and for PFR $X^2 = 0,039$ $p < 0,9$ (table 2). The high percentage of decreased values of FEV₁ and PFR in the intermittent patients confirm a discrepancy between subjective evaluation of dispnea and lung function. (table III). Discrepancy between lung function and clinical evaluation is particularly marked in mild persistent asthma (table 3) and a better concordance only found in moderate persistent asthma (table 4).

DISCUSSION

The actual guidelines for asthma include, as criteria for classification simultaneously the clinical data based on the frequency of symptoms, the duration of exacerbations, nighttime asthma symptoms and finally the values of FEV₁ and PEF. However the correlation between clinics and lung function has not been evaluated in clinical series. Discrepancies between the clinical evaluation of dyspnea and both methods for lung function, FEV₁ and PEF determinations have been previously reported but a comparative study between clinical classification of severity and lung function data has not been previously done, as long as we know.

The present results show that clinical data are not correlated in intermittent and mild persistent patients with lung function. The results observed don't fit with the

	Number of Patients	Decreased FEV ₁	Decreased PEF
STEP 1 Intermittent	66	51 (77,2%)	53 (80,3%)
STEP 2 Mild Persistent	61	59 (96,7%)	59 (96,7%)
STEP 3 Moderate Persistent	26	24 (92%)	25 (96%)
STEP 4 Severe Persistent	0	0	0

Table 1 : Classification of asthma.

	GUIDELINES	PRESENT SERIES
STEP 1		
Intermittent		
FEV ₁ > 80	100%	49%
Predicted		
PEF > 80%	100%	47%
Predicted		
STEP 2		
Mild Persistent		
FEV ₁ > 80%	100%	3,3%
Predicted		
PEF > 80%	100%	3,3%
Predicted		
STEP 3		
Moderate Persistent	100%	92%
FEV ₁ > 60%		
< 80%		
Predicted		
PEF > 60%	100%	96%
< 80%		

Table 3 : Comparison between proposal guidelines and present series.

Distribution of abnormal functional results intermittent asthmas versus mild and moderate persistent

$X^2 = 8,91$ $P < 0,01$ for PEF

$X^2 = 9,00$ $P < 0,01$ for FEV₁

Mild persistent versus moderate persistent

$X^2 = 0,12$ $P < 0,8$ for PEF

$X^2 = 0,039$ $P < 0,9$ for FEV₁

Table 2 : Statistical analysis.

STEP 1	
Intermittent	51%
FEV ₁ > 80%	
Predicted	
PEF > 80%	53%
Predicted	
STEP 2	
Mild persistent	96,7%
FEV ₁ > 80%	
Predicted	
PEF > 80%	96,7%
Predicted	
STEP 3	
Moderate Persistent	8%
FEV ₁ > 60%	
Predicted < 0%	
PEF > 60% < 80%	4%

Table 4 : Discordance between guidelines and present series.

guidelines proposed groups in 51% for FEV₁ and 53% for PEF of the intermittent asthma patients, 96,7% of the patients with mild persistent asthma and 8% for FEV₁ and 4% for PEF in moderate persistent asthma. In practice a good correlation between the functional criteria proposed by the guidelines and GINA and observed results was observed only in moderate persistent asthmas but not either in intermittent or moderate persistent asthmas. The results of FEV₁ or PEF evaluations must probably be completed by a study of reversibility in most patients which however is not always possible in practice and is also time consuming.

Therefore the classification of asthma severity based simultaneously on clinical data, FEV₁ and PEF is subjected to great errors and each patient must be carefully evaluated before being classified in order to establish a clinical classification and the different steps of medication which are based on the level of severity. In the same way when the control of asthma is achieved and maintained the gradual reduction of therapy must be individually tried on the basis of a criterious evaluation, case by case, of clinical data and lung func-

tion study including probably not only an initial evaluation of PEF and FEV₁ but also a reversibility study.

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