

THE IMPORTANCE OF ASTHMA EDUCATION IN PATIENTS WITH ASTHMA*

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SUMMARY

Despite recent developments about the diagnosis and treatment of asthma, the increasing trend in morbidity and mortality puts weight on providing the patients with the essential information. This study was carried out among two groups of patients; Group I included 22 patients who had been receiving treatment at our Allergy and Asthma Center, Group II involved 21 patients who applied for the first time. All the patients [16 male, 27 female, mean age 28 (10-49)] were randomly selected.

The study was performed in two stages which were pre-training and post-training. Patients were asked to fill a questionnaire followed by a brief explanation of performing proper MDI technique. In the second stage all the participants were given an educational program on asthma. Our success rate in performing the correct MDI technique was 37% (16/43) before education; and 72% (31/43) after education. The consistency between the observer and the monitor, when the correct and incorrect techniques were evaluated altogether, was found as 88.4% (38/437).

In conclusion, this study helped to reveal that patients with bronchial asthma do not have sufficient information about the disease and the drugs they are administered, that training have a corrective role in the MDI use, and in the absence of monitoring devices, an observer near a MDI using patient may draw correct scores as to the performance.

Key Words : Asthma, education, MDI techniques, monitoring

INTRODUCTION

Bronchial asthma is an important chronic health problem affecting people of all ages (1). The prevalence of the disease under the age of 15 is reported to be 5% in England, while this is 10.5% in the U.S (2, 3). Dağlı et al (4), have carried out a study in İzmit and Yarımca, where there is heavy air-pollution in winter and have found the prevalence of the disease as 21.9% and 9%, respectively.

In contrast to other chronic diseases and apart from its growing prevalence mortality rates due to bronchial asthma increase in countries such as the United Kingdom and the U.S. (3.5-7). The British Thoracic Association holds that 86% of deaths from asthma is preventable and recommends a carefully performed medical care and follow-up in asthmatics

(5, 6). Moreover, there are several studies indicating that shortcomings in patient training account for the rise in mortality and morbidity (3, 5-10). This training involves giving the related information to the patient about his/her disease (What asthma is, what its triggering factors are, what peak flow meter is, how the drugs are classified according to their mechanisms of action, etc.) and teaching patients about correct usage of inhalers (3).

The object of our study is to evaluate whether asthma education and training programme is of significant benefit to the management of asthmatic patients.

MATERIALS AND METHODS

Patients

The study included two groups of patients. Group I consisted of 22 patients who had been receiving treatment at our Allergy and Asthma Center. Group II involved 21 patients who applied for the first time. All the patients [16 male, 27 female, mean age 28 (10-49)] were randomly selected and informed consent was obtained from each subject before the study. The cases were diagnosed as bronchial asthma depending upon American Thoracic Society (ATS) criteria and patient history, physical examination, radiological examinations, and respiratory function tests (11). Attention was given to the point that the patients did not have any neuromuscular disease signs, susceptibility to additives used in metered-dose inhalers (MDI), or any acute or chronic orofacial disease which would prevent the patients from applying MDI to the lips. Demographic data and patient histories are classified in Table I.

Table I: Demographic data and patient histories

	Group I	Group II
Total	22	21
Female / male	13/9	14/7
Mean age	30.3	26.8
Education status		
Illiteracy	1	3
Primary school	10	10
Junior high school	4	4
High school	7	2
University	-	2
Mean duration of symptoms (year)	5.8	8.1
History of smoking		
Current	3	-
Passive	8	8
No smoking	11	8

p>0.05

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Study Design

The study was performed in two stages: pre-training and post-training. During the first interview with the patients, they were asked to fill a questionnaire followed by a brief explanation of performing proper MDI technique. Thereafter, each patient performed three MDI inhalations which were monitored by the aerosol inhalation monitor (AIM). The first stage of the study was completed with delivering education materials and performing audiocassette tape presentations.

In the second stage, 40 days after the first, all the participants were invited and given an educational conference on asthma, in which patient questions on the issue were answered. The succeeding days went on with a second round of interviews in which the same questionnaire was filled and MDI technique was assessed using AIM monitorization.

Questionnaire and Training Material

The patients were asked to fill a questionnaire consisting of 58 questions about the diagnosis and the extent of their disease (12 questions), triggering factors (8 questions), principles of treatment (23 questions), peak flow meter (2 questions), spacer (2 questions), and allergy and immunotherapy (11 questions). Thereafter they were delivered some brochures and some booklets so that they could derive the correct answers to the questions given in the questionnaire. The training program also included a 2-session of audiocassette tape presentation performed every day in the clinic.

Objective Monitoring

The aerosol inhalation monitor (AIM-Vitalograph) and placebo MDI (Glaxo) were used in the study. Out of 11 recommended MDI using steps, we were able to monitor the 7th, 8th, 9th, and 10th steps using this monitor since these were likely to be misinterpreted through the naked eye (12, 13) Table II). Using vitalograph the seventh step (MDI firing error - begin breathing then actuate canister once), the eighth step (inhale for 3 seconds), and the ninth step (holding breath for 10 seconds) were scored as A, B, and C, respectively.

Table II: Steps used to assess demonstration scores

Step	Metered - dose inhaler
1	Remove cap
2	Shake inhaler
3	Hold inhaler upright
4	Tilt head back or keep at level
5	Exhale to functional residual capacity (FCR) or residual volume (RV)
6	Insert or keep mouthpiece 2-4 cm away from mouth
7	Begin breathing, then actuate canister once
8	Continue slow, deep inspiration for 3s
9	Hold breath for 5 - 10 s
10	Exhale, wait for 20 - 30 s before a second actuation
11	Shake again before a second actuation

Subjective Monitoring

In the two stages of the study each patient actuated the device three times. During the third inhalation an experienced instructor (E.A.) scored the patient's MDI technique simultaneously without knowing the AIM results (3, 12, 14, 15).

Statistical Analysis

The characteristic features of two groups were analyzed by χ^2 test, Student's t test, and Mann-Whitney U-test. The number of pre-education and post-education correct responses from patients regarding their knowledge of their diseases and drugs were compared within the same group and between the two groups using Wilcoxon test and Mann-Whitney U-test, respectively. The correct use of MDI technique within each group was analysed by χ^2 test. Spearman's correlation coefficient (r) was used to determine the consistency of the results between the observer and the monitor.

RESULTS

The results obtained from Group I and Group II were comparable (16) (Table I). The patients' pre-education correct responses regarding their bronchial asthma knowledge were higher in Group I than they were in Group II, but the difference was not statistically significant. The accuracy of responses elicited within each group after the educational sessions and interviews showed a statistically significant increase ($p = 0.001$ and $p=0.007$, respectively). However, the patients' post-education correct responses did not yield a significant difference between the two groups (Table III).

Monitorization of the MDI use revealed that the correct use of MDI reached 72% (31/43) following the educational programs, which had been only 37% (16/43) in the initial monitoring, the difference being statistically significant within each group ($p < 0.05$ and $p < 0.05$, respectively). In 88.4% of cases (38/43) the results from the monitor and the observer were consistent. Upon assessing the correct MDI technique, we found a statistically significant correlation between the monitor's and observer's detections ($r_s=0.72$; $p < 0.001$) (Table IV).

DISCUSSION

The objective of treatment in bronchial asthma is to use minimum doses of drugs in keeping symptoms under control (17). One drawback in achieving this objective on the part of the patient is the failure to get drugs regularly and to avoid triggering factors (7). Comprehensive studies have demonstrated that asthmatic patients lack necessary knowledge about the disease and the drugs employed (3, 5-10). Effective ways of educating patients would help reduce mortality. However, during routine examinations physicians inevitably confront with several difficulties in correcting misconceptions and enlightening the patients (8).

Table III: Correct answers obtained from patients about their disease and drugs

Questions	Correct answers			
	Group I		Group II	
	(n=22)		(n=21)	
	BE	AE	BE	AE
What asthma is and what triggering factors are	3	19	1	14
About drugs				
Actions	14	21	7	20
Colors	22	22	12	21
Side effects	3	9	1	15
How and when they are used	20	22	7	21
Whether they know why they gargle their mouth	5	20	1	19
Whether there is difference between oral and inhaler use				
Effects	13	21	4	19
Side effects	10	19	6	18
What peak flow meter is	1	22	0	21
What spacer is	10	22	3	18
Whether they are aware of signs of deterioration	3	17	2	18
What they use during acute attacks	20	22	12	21
What the three-zone step system is	0	20	0	20
When they are to apply to physicians	3	19	1	19

BE = Before education AE = After education
 BE1 BE2 p>0.05 (NS)
 AE1 AE2 p>0.05 (NS)
 BE1 AE1 p=0.001
 BE2 AE2 p=0.007

Table IV: MDI scores obtained by Vitalograph and the expert observer

	Group I		Group II	
	BE	AE	BE	AE
Correct uses assessed by monitor	8	16	8	15
	p<0.05		p<0.05	
Correct uses assessed by the observer	10	17	8	16
	p<0.05		p<0.05	
Matching results altogether (correct + incorrect)	19		19	
	$r_s = 0.72; p < 0.001$			

BE = Before education AE = After education

Even providing treatment within the hospital setting will be of little benefit to the regular use of drugs, unless an additional educational program is put into practice. From the interviews they made with 157 patients who received hospital care, Bucknall et al (5) observed that the patients' complaints were for some time relieved as a result of the treatment prescribed after discharge, but later they did not have access to corrective and maintenance treatment to prevent them from developing nocturnal and early morning asthma as well as reduced exercise capacity.

Recent studies showing favorable outcome of educational drives in patients with hypertension and diabetes mellitus (6, 7) have produced a stimulating impact on the education of bronchial asthmatics (2, 3, 6, 7, 9, 10, 18-20).

A considerable number of studies exist in the literature on the means of education. Jenkinson et al divided their patients into four groups in which they applied education with either books, or audiocassette tapes, or books+audiocassette tapes, or neither (7). Educational materials gave favourable results, with better learning in groups provided with tapes and books + audiocassette tapes. Another aspect of the educational program may be the number of patients given education at a time. Wilson et al obtained more fruitful results in one of their two groups, having the smaller number (3). In conclusion, whatever the access to education is, in groups receiving education, especially when special care is not spared, achievement of the following consequences are inevitable: patients' extension of knowledge about their diseases and drugs, an improvement in their symptom scores, a decrease in their need for drugs, diminishing acute attacks, relieving nocturnal and early morning dyspnea attacks, increased exercise capacity, and a decreasing need for seeking medical treatment (2, 3, 6, 7, 9, 10, 18-20). A review of literature suggests that studies favoring educational impact on morbidity and mortality (3, 6-8, 19) are greater in number than those maintaining small effectiveness of educational programs on reducing morbidity such as school absences and health care utilization (2, 21).

In this study the education program performed improved the patients' understanding of the disease and expanded their knowledge about the drugs they used. Responses elicited from the patients before the education course showed that the patients that had already been under medical care were more knowledgeable than those in Group II. Following the education, however, the number of correct responses significantly increased in both groups. Whether this could play a part in changing the severe course of the disease can be observed through a long-term follow-up.

The proven efficiency of inhaled drugs in the treatment of bronchial asthma has led to a widespread usage of metered-dose inhalers (MDI) (22-25). Factors such as rapid onset of actions with

fewer adverse effects weigh heavily on their wide use, whereas requirement of some special maneuvers in order to get the highest benefit and the possible misuses present some limitations. There are several studies showing a high rate of misuse of MDIs (24%-89%) among patients (13, 26, 27).

Misuse of MDIs arises not only from reasons on the part of the patients but also from some shortcomings of health professionals who are responsible to instruct the patients with the correct technique (13, 26, 27). Kelling et al have found that only 40% of physicians could perform correctly four or more of the 7-step inhalation maneuver (28). These data strongly recommend that, in cases with bronchial asthma, teaching the proper use of MDIs is an essential aspect in designing patient education (3, 17). Our initial success rate in performing the correct MDI technique was 37% (16/43); the educational program enabled us to obtain a success rate of 72% (31/43). It is a notable fact that there was no difference between the initial success rates of the two groups in terms of the proper use of MDIs (8/22, 8/21). This does not only cast doubts on the effectiveness of hospital follow-up in establishing drug usage with the correct technique, but also directs attention to the relevance of education.

Given the fact that not all asthma clinics might have monitoring opportunities (Vitalograph) and that the physicians might be short of time to utilize the monitoring technique, we sought to find out to what extent an experienced personnel could play a monitoring role (3, 12, 14, 15). The consistency between the observer and the monitor, when the correct and incorrect techniques were evaluated altogether, was found as 88.4% (38/43).

In conclusion, this study helped to reveal that (a) most patients with bronchial asthma do not have sufficient information about the disease and the drugs they use, (b) training has a corrective role in the MDI use, which will probably lessen the patient's complaints and somewhat ameliorate the course of the disease, and (c) in the absence of devices for monitoring, an observer may also note the correct scores of the patient's performance.

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