REVIEW ARTICLE

Attitude Changes Needed to Foster Treatment Adherence in Patients With Asthma

A. López Viña

Hospital Universitario Puerta de Hierro, Madrid, Spain.

Introduction

Although asthma is a disease that cannot be cured, it can be treated and controlled.[1,2] A series of studies published between 1985 and 1990 demonstrated that asthma is a chronic inflammatory disease,[3-6] and shortly after this it was shown that patients on long-term antiinflammatory therapy could remain free from symptoms and maintain normal lung function.[7] The different guidelines on the diagnosis and treatment of asthma include simple protocols for correct patient treatment.[1,2] All these developments gave rise to the general impression among physicians that asthma was an easy illness to control whereas, paradoxically, epidemiological studies have shown that in practice asthma is inadequately controlled in most patients. In the AIRE[8] study for example, asthma was fully controlled in only 35% of patients. The ASES[9] study showed that, even when apparently correct treatment was implemented, the illness was poorly controlled in over half of all patients. It is clear, therefore, that while in theory asthma is easy to control, in practice it is poorly controlled in many patients. The most commonly cited explanation for this paradox, particularly when the treatment prescribed is appropriate, is that patients do not adhere to the treatment plan.[9-11]

Given the low levels of adherence found among patients with asthma, it is not surprising that nonadherence is a determining factor in this lack of control. Asthma patients take their medication only 50% of the time,[12] even less often than patients with hypercholesterolemia[13] or hypertension,[14] who take their medication 60% and 70% of the time, respectively. Numerous studies have confirmed this low rate of adherence, although the range is very broad (from 15% to 65%) owing to differences in the populations or treatment regimens studied, and the parameters measured.[15-23] It is, therefore, clear that in clinical practice the patient's failure to adhere to the prescribed treatment limits the success of therapy. When faced with therapeutic failure, medical professionals tend to choose easy but usually erroneous solutions, such as increasing the dose, prescribing additional medication, or changing the treatment regimen. Since the most common cause of therapeutic failure is nonadherence, none of these strategies leads to success. The reason such solutions are often used is that many physicians believe that patient nonadherence is not their problem and consequently do nothing to address it directly. A change of attitude on the part of medical professionals would have a considerable impact on the therapeutic decision because adherence, while depending mainly on the patient, is also influenced by the physician's attitudes and interest in changing the patient's behavior by way of advice. Medical professionals must implement strategies aimed at fostering adherence.

The medical literature does not yield any studies showing that simple interventions are effective in improving overall adherence. Some such interventions may perhaps improve adherence in certain specific situations.[24] While the discovery of a simple intervention effective in all situations would be the solution to all problems of adherence, it is not surprising that such a panacea has not been found since a universal remedy would only be possible if nonadherence were a straightforward problem. But it is, on the contrary, clearly a multifactorial problem involving a broad range of determining factors. In contrast to the thousands of clinical trials on the efficacy of different drugs, very few rigorous studies have been undertaken to study the problem of adherence to treatment.[24] The studies that have been done show that the strategies currently in use are rather ineffective notwithstanding the considerable effort and resources they entail. Undoubtedly, this is in part due to the difficulty of designing a study that can demonstrate the efficacy of a non-drug intervention. Moreover, the methodology used tends to differ considerably from one

Correspondence: Dr A. López Viña.
Hospital Universitario Puerta de Hierro.
San Martín de Porres, 4. 28035 Madrid. España.
E-mail: alopezv@separ.es

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TABLE 1
Types of Nonadherence

Erratic adherence	The patient knows how to take the medication but forgets to take it part of the time
Unintentional nonadherence	The patient is unaware of his or her failure to follow the treatment plan correctly owing to poor understanding, incorrect inhalation technique, dementia, etc
Intentional nonadherence	The patient takes a personal decision to stop taking the medication because he or she believes it to be ineffective, unnecessary, or dangerous

study to another. However, lack of evidence for the efficacy of strategies to improve adherence is also due to the impossibility of standardizing interventions aimed at fostering adherence, since adherence behaviors themselves are not standard.

There are various types of nonadherence (Table 1). In fact, patients may even intentionally decide not to comply with the treatment plan.[25,26] Obviously, an intervention that may be effective in certain situations (such as training patients who forget to take their medication to use memory aids) may not be of any use in others (for example a patient who avoids taking medication because of the undesirable side effects it causes).

The starting point for any intervention aimed at improving therapeutic adherence should be to understand how and why patients decide to take some types of medication and not others, and to identify the factors that influence the likelihood of a patient changing his or her behavior. According to a model developed by Tousman et al,[27] behavioral change can be explained by a series of variables relating to 3 general factors: patient characteristics; the techniques used in the intervention; and how the intervention program is structured. These 3 factors must be taken into account in the design and development of any educational program aimed primarily at fostering patient adherence to treatment.

Patient Variables

The patient variables with the greatest influence on adherence are knowledge about asthma, motivation to change, personality traits, and state of health.

Basic Knowledge

Cognitive psychologists maintain that humans organize knowledge into schemas that guide their behavior in a general way.[28] If patients have a schema containing insufficient knowledge this may determine not only their beliefs but also their decisions and behavior. Patients' schemas are often the origin of the reasons they cite for not taking the drugs that would control their disease (the fact that they dislike taking medication on a daily basis or the adverse effects) and of the reasons they treat their asthma with bronchodilator medication (because of the immediate relief obtained). In fact, some asthmatics are unaware that there is a difference between inhaled and oral corticosteroids, and therefore tend to believe that the unwanted side effects are the same in both cases.

Once studies had shown that asthma was a chronic inflammatory airway disease, doctors modified their management approach.[3-6] Logically, therefore, patients also need to understand this fact if they are to change their adherence behavior. It is interesting to note that numerous studies have shown that most patients are unaware that inflammation of the airway is involved in asthma.[29] It is unsurprising, therefore, that the reason most often cited by patients for not taking inhaled corticosteroids as prescribed is that they consider such medication to be unnecessary during asymptomatic periods and are worried about undesirable side effects.[30]

Motivation for Change

The patient's willingness to change is a key factor in the process of behavior modification. Motivation is defined as the likelihood that a person will initiate, maintain, and adhere to a specific strategy for change.[31] This definition recognizes that changes in behavior, rather than being instantaneous, usually involve a process comprising various stages over a period of time. This applies equally to spontaneous changes and to those triggered by an outside intervention, such as a doctor's advice. This process is defined in the transtheoretical model of behavioral change,[32-34] which describes the stages of change and explains them in terms of a progression that starts with precontemplation, continues with contemplation and preparation, and moves on finally to action (change) and maintenance. This model is used widely by antismoking counselors as part of their smoking cessation strategies[35] and to motivate people to do exercise,[36] but it can also be used to resolve adherence problems in patients with asthma[37] and other chronic illnesses. In fact, Miller and Rollnick[38] have published guidelines based on this model.

In the precontemplation stage, patients rebel, are in denial, or resign themselves to the disease, and it is therefore unlikely that they will adhere to any treatment plan. During this stage, their consciousness must be raised by providing them with information, by offering them options and hope, and by encouraging them to reflect. During the contemplation stage, patients are open to receiving information but still retain certain ambivalence, making it unlikely that they will follow medical advice. Consequently, in addition to providing information, the physician should help them to analyze the pros and cons of their situation and to develop their self-efficacy. Patients in the preparatory stage have decided to take action. This is the time to help them identify and agree on goals, to teach them strategies for change, and to reinforce their decision in order to further motivate them. In the action stage, patients are actively changing and assessing their situation and what

they have achieved. This is the moment to teach them self-care skills and to provide further reinforcement. Since the maintenance stage always entails the risk that patients may fail to adhere to the treatment regimen, they must be taught preventative strategies that will help them to avoid such failure. They also need further reinforcement and help in redefining goals.

In light of the above, it is clear that the likelihood of patients adhering to a given treatment plan increases if their health professionals offer them the support and strategies appropriate to the stage of change they are in at the time.

Personality Traits

Certain personality traits influence treatment adherence.

Self-efficacy is a person's belief about his or her ability to behave in a certain way or perform a particular action (for example learn a skill).[39] People with the same objective ability to carry out a task perform differently depending on whether they perceive themselves to be capable or incapable of doing it. Patients who believe that they are not capable may not even attempt to perform the task or, if they do try, they do not invest enough effort and will abandon the task when they encounter any difficulty. In such patients, the likelihood of failure is high. This explains why some people perform badly in school and even in sports. Studies of asthma patients show that lack of self-efficacy predicts hospitalization and nonadherence to treatment.[40,41]

Learned helplessness is a perceived loss of control over one's environment.[42] This perception leads people to believe that what is happening is not related to their behavior. This syndrome is the result of a history of failures in dealing with situations. Some adolescents with asthma see their problems as insoluble and exhibit the symptoms of learned helplessness. As a result they believe that nothing they can do will help to control the situation.[43]

Studies have also revealed an association in asthma patients between depression, ineffective control of the disease, and nonadherence.[44,45] In a study of 102 asthmatics, Bosley et al[44] observed that the group of patients who did not adhere to treatment scored higher for depression on the Hospital Anxiety and Depression Scale than patients whose adherence was good. It is, therefore, important to consider the possibility of depression in the management of certain patients with asthma, particularly those who fail to adhere to treatment.

State of Health

It would seem logical to assume that the severity of the patients' disease would have an impact on their adherence behavior because those with more symptoms would tend to follow the treatment regimen better than those who felt healthy. Studies that have analyzed this question find a very weak association between severity of illness and treatment adherence,[46] although adherence may improve immediately after a life-threatening attack, something similar to what happens with patients who have suffered a myocardial infarction or transplant rejection. It is possible, therefore, that visits to emergency departments and hospital stays after asthma attacks may be opportune times for implementing an educational intervention directed at improving adherence.[47,48]

Behavioral Techniques That Should Be Used in Education Programs

We cannot expect that interventions that do not help patients to modify the factors influencing their behavior (and consequently do not facilitate change) will give rise to positive results in their use of medications, preventative measures, and health services. Health-care personnel must use strategies (techniques) that have been shown to change patients' behavior.

Behavior modification techniques can be classified into 2 categories[27]: *a)* indirect techniques—so called because they do not lead specifically to a change in behavior, but do make a change more likely—such as the medical interview or improving the patient's understanding; and *b)* direct techniques specifically focused on behavior modification, including making therapeutic and preventative recommendations, taking decisions and setting goals jointly with the patient, and teaching skills.

Indirect Techniques

The medical interview. The health care personnel's first opportunity to foster a change of behavior is the patient's review visit. The medical interview is an excellent way of analyzing the patient's situation and achieving behavioral change. An effective interview should be based on good communication (providing empathy and psychosocial support) in order to establish a good physician-patient relationship and elicit information about knowledge, emotions, beliefs, expectations, and goals.[49] In order to achieve this high level of communication with patients, 2 prior measures are essential. In the first place, the physician must acquire the necessary communication skills since these are not innate and do not improve with experience without initial training.[50,51] Furthermore, since the paternalistic model (in which the physician decides what the patient must do) does not lead to good communication[52] a good second measure could be to exclude this model.

Basically, the following recommendations should be implemented to achieve an effective interview: *a)* signal attention using nonverbal cues (eye contact, being seated, gestures and postures that indicate that you are listening to and paying attention to what is being said); *b)* engage the patient in interactive conversation; *c)* investigate patients' knowledge, concerns, beliefs, and expectations, explore the limitations the disease places on their daily lives and the concerns this gives rise to (use simple questions related to each patient's experience, interspersing some questions about positive aspects of

the particular case so as to encourage the patient, avoid emphasis on negative aspects, and never censure the patient); *d)* try to find out what objectives the patient had for the consultation, and build an agreement on this basis. Patients' objectives are normally related to the limitations the disease imposes on their everyday life, and this makes it easy to achieve the medical objectives of the treatment by meeting the patient's objectives; *e)* review the treatment plan, check that the patient fully understands the regimen and that it is adapted to his or her lifestyle; *f)* bring up the subject of adherence, find out what the patient thinks, and ascertain what difficulties he or she encounters in following the treatment plan; and *g)* show patients how they can follow treatment, in other words, increase their self confidence.

The physician who makes an effort to ensure that communication is interactive establishes a better relationship of trust with the patient, and this tends to lead to improved adherence. It would seem logical (and has been demonstrated) that an effective medical interview affords the patient a high degree of satisfaction. Patient satisfaction produced by good communication and empathy coupled with continuity of help and support increases the likelihood of treatment adherence. The physician-patient relationship is the most powerful tool for achieving behavioral change, and patients do not reveal their beliefs about their illness to a doctor who is angry, uninterested, or impatient.[53,54] Adherence improves when recommendations are explained in clear language, adherence to treatment is praised, and problems are resolved. It also improves when the physician is willing to modify the treatment plan taking into account beliefs expressed explicitly by the patient or intimated by way of nonverbal cues, and shows an interest in what the patient has to say.

It is difficult to demonstrate the efficacy of nonpharmacologic factors, such as good physician-patient communication. Nonetheless, Apter et al[15] showed that poor adherence is associated with poor communication between the physician and the patient. In a randomized clinical trial, Clark et al[55] evaluated the long-term impact of a communication skills seminar for pediatricians. On follow up after 2 years, the children treated by the pediatricians who had participated in the seminar had fewer hospital admissions per year, and the parents scored these individuals higher on 5 communication skills. Although it may seem surprising, the trained clinicians did not spend more time with patients, they simply used the available time to better effect.

Increasing the patient's knowledge. Another indirect strategy that can effect a change in behavior is increasing the patient's knowledge about the disease and its treatment. According to the cognitive theory of psychology, information is transferred from short-term memory (which is immediate and transitory, lasting at most a few minutes) to long-term memory, where the information is retained for days, weeks, months, or years and stored in each individual's personal schema so that it can be easily retrieved.[56] Therefore, the way information is communicated plays an important role in the effectiveness of the intervention. When information is communicated actively, by way of interactive conversation for example, it is more likely to be processed and retained. Conversely, when information is received passively (when the patient is only listening or looking), retention is poor because it is unlikely that this input will be transferred from the short-term to the long-term memory, making a change in behavior very improbable.[57]

Techniques that make use of interactive discussion and engage participants actively in the educational intervention are much more effective in improving patients' knowledge and changing their behavior. Physicians who listen to their asthmatic patients and exchange information with them gain a better understanding of the patient's beliefs and schema, and will be in a position to modify erroneous beliefs and provide each person with additional information relevant to his or her specific needs.[58]

The following basic recommendations should be followed when giving a patient information[56,60]: *a)* the interview should be individualized and tailored to the patient's expectations and objectives, that is, to what the patient wants; *b)* the information and educational content should be restricted to only what is applicable to the specific patient's case; and *c)* the basic information should be focused on teaching the patient that asthma is a chronic disease requiring long-term treatment (even when no symptoms are present), and ensuring that the patient understands the difference between inflammation and bronchoconstriction, and between antiinflammatory therapy and quick relief medication, and recognizes the symptoms of the disease and the undesirable side effects of the drugs.

It is advisable to use a script to guide the informative interview. Important points should be covered first and last (since information given at these times is better remembered). Information should be brief and to the point and communication interactive. The explanation should be adjusted to what the patient will understand. Analogies and examples should be used, and written support materials given to each patient. Information should be repeated and reinforced on subsequent visits.

It should be remembered that the fact that a patient acquires a correct understanding (regardless of the method used) does not necessarily translate into changes in behavior. For example, knowing that tobacco is harmful does not necessarily lead the smoker to give up the habit. An increase in basic understanding and knowledge is important but not sufficient in itself. Consequently, educational programs that only impart information do very little to improve morbidity in asthmatic patients.[61]

Direct Techniques

Medical recommendations. The direct method most often used by doctors to change patient behavior is to directly recommend a particular change in behavior in

TABLE 2
Recommendations for Drawing Up a Treatment Regimen

Prescribe the fewest possible number of daily doses (1 or 2 per day)
Use the inhalation method the patient finds the easiest (the one the patient chooses)
Use the same inhalation method for all medication (or the best combinations)
Evaluate the use of combinations
Review the results of treatment with the patient
Negotiate the number and timing of doses adapting the regimen to the patient's daily activities
Discuss cost
Engage the patient in a dialogue about adherence
Ensure that the patient uses memory aids
Assess what is the least disruptive regimen on a case by case basis

the form of a treatment plan and/or advice on preventative measures and ways to avoid attacks. Since adherence is very poor among asthma patients,[15-23] this technique is of limited use in modifying patient behavior. The physician who uses the direct method does not influence the patient's schema, and the patient may continue to have erroneous beliefs concerning asthma and a poor understanding of the condition. When patients are taking the decision to use inhaled corticosteroids every day, their behavior is influenced to much greater extent by their inadequate knowledge and beliefs than by their doctor's recommendations.[30] Moreover, the physician who draws up a treatment plan without consulting the patient is establishing a paternalistic relationship—a model known not to favor adherence. If it is to be effective, the doctor-patient relationship must be based on mutual trust and respect, exchange of information, and cooperation, and this means that the treatment plan must be defined jointly by both parties.[62]

Taking decisions jointly with the patient. Taking decisions jointly with patients is a much more effective way to change their behavior than direct medical recommendation. Patients want to be involved in decisions concerning their therapeutic regimen and changes in treatment. One study evidenced that 50% of patients were unsatisfied when their doctors failed to involve them in therapeutic decisions, and it was precisely this group of patients that had the lowest level of adherence.[63]

Studies of patients with moderate and severe asthma show that they prefer physicians to play the major role in the medical management of their asthma, but at the same time they do want to be given more information and to be involved when a decision is taken to change their medication.[63,64]

The recommendations shown in Table 2 should be taken into account when drawing up a management plan for a patient with asthma.

Goal Setting Procedure and Skills Training

Patients with asthma must learn how to take inhaled medication correctly, recognize and avoid situations likely to trigger attacks, monitor their own symptoms and peak expiratory flow rate, recognize when their asthma is worsening, and know how to take early action when this occurs. These skills should be taught using educational methods tailored to the needs of each patient and effective behavioral techniques.

Tousman et al[27] describe a procedure for asthma education they call "goal setting." The procedure includes the following steps: *a)* determine the goal of the behavioral change (for example, acquisition of a particular skill); *b)* teach the patient the skill; *c)* the patient practices the skill outside of the doctor's office; and *d)* offer the patient an opportunity to discuss and analyze the results.

For example, a goal could be for the patient to monitor peak expiratory flow rate at home and implement a self-management plan using this information. The first step in Tousman's method[27] is for the physician and patient to decide jointly that the patient will monitor peak flow at home for a specific period and use the resulting information to detect any deterioration. The task is no longer just a question of providing the doctor with data for analysis. The educator then teaches the patient the correct technique for measuring and recording peak flow, and the patient practices the technique in the doctor's office until he or she can do it correctly. Subsequently, the patient measures and records peak flow at home and later discusses the record with the caregiver. In addition to reinforcing the patient's behavior with praise, the educator teaches the patient how to use the data to assess when asthma is well controlled and when it has started to worsen. Then the physician, working jointly with the patient, draws up a second treatment plan to enable the patient to take action as soon as any deterioration in peak flow is observed.

A similar method, adapted to the peculiarities of each skill and patient, should be used to teach other necessary skills.

Numerous studies analyzed in a systematic review[65] confirm the efficacy of educational programs based on written action plans, self-monitoring, and regular medical reviews.

Training Program Structure

If a training program aimed at modifying behavior is to be effective, the structure must be appropriate. Educational programs that merely provide information have no impact on treatment adherence or morbidity.[61] In contrast, programs that include education coupled with written self-management plans and regular review improve the control of asthma and reduce the use of health care resources.[65] Any reduction in the intensity of the educational component (action plans implemented on the basis of purely verbal instructions, less

educational content, or a lack of regular reviews) decreases the effectiveness of these programs.[65] Consequently, any educational strategy that forms part of a patient management plan should include an analysis of the characteristics of such programs, including the use of indirect and direct techniques for changing behavior and a format that includes ongoing education with reinforcement at every review.

Continuity and access to caretakers are essential components of any management plan. Regular appointments must be scheduled, waiting time should be short, and the duration of the visit adapted to the patient's requirements. Written reminders should be given, particularly when the appointment is not immediate. The atmosphere in the waiting room and the doctor's office should be calm and welcoming. It is important that patients see their doctor as an accessible ally, a person who they can discuss their doubts and worries with, ask questions, and even telephone in specific situations.[66]

Conclusions

Very often the only use physicians make of review visits with asthma patients is to gather information about the individual's current state of health and to prescribe a therapeutic regimen. The physician-patient relationship is almost always based on a paternalist model. It is also common for clinician's to consider that treatment adherence is not their problem and even for them to abandon nonadherent patients to their fate, writing them off as uncooperative and, therefore, deserving of whatever may happen to them. However, it is possible that the best strategy for increasing the very poor adherence found among asthma patients could be a change of attitude on the part of health professionals with respect to this problem.

Information about the patient's state of health has less impact on adherence than knowledge, motivation, and certain personality traits. To improve the patient's knowledge and understanding, the clinician must gain an understanding of his or her schema, character, and willingness to change. Moreover, if doctors are to be successful in changing their patients' behavior and improving adherence, they should not only involve them in decisions about treatment plans and teach them the skills they need, but also use effective teaching methods and strategies aimed at achieving behavioral change. Long-term improvements in adherence require ongoing intervention,[66,67] so the same practices should be incorporated into the long-term management program, which should include reinforcement of information, monitoring, and ongoing skill training in addition to reinforcement of adherence.

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