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Editorial

Test of Adherence to Inhalers☆

El test de adhesión a los inhaladores

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The WHO believes low treatment adherence by patients to be a serious global health problem that affects all regions, cultures, ages, and diseases, and rates have remained unchanged in the last 30 years.[1] Poor therapeutic adherence is associated with higher mortality, frequent exacerbations, worse control, and greater socioeconomic costs, both in asthma[2] and in COPD.[3]

The high clinical impact of the problem has led the authors of the latest clinical practice guidelines on asthma and COPD to emphasize the need to actively identify and actively correct lack of compliance. Simply asking the patient during a clinical visit if he has taken his prescribed treatment will invariably lead to an overestimation of the rate of adherence, so other more reliable methods are recommended. These range from inexpensive techniques that provide immediate results but are less robust (questionnaires, electronic records of prescription collection), to others that are more costly and time consuming, but which give a more accurate estimation of adherence (medication counts/weighing, drug levels in blood, electronic devices recording inhaler use). Complexity and costs mean that the second set of techniques are more usually applied in research, while the first are used in standard clinical practice. The simplest methods are probably self-administered questionnaires. The gold standard is the Morisky–Green, which was designed to evaluate compliance with oral drugs in the treatment of arterial hypertension.[4] More recently, the Medication Adherence Rating Scale for Asthma (MRS-A) was developed to determine adherence to inhaled corticosteroids in asthma. This tool was adapted from a questionnaire initially designed to evaluate treatment adherence to oral drugs in depression.[5]

Inhalation drugs, despite being the first choice in the treatment of asthma and COPD, may have some drawbacks. Some of the particular features of inhalers (learning inhalation techniques, different inhalation techniques depending on the device used, manual skills

required for use, cultural aspects, etc.) can contribute to poor adherence. These aspects undermine the effectiveness of the standard questionnaires for assessing the use of inhaled medications, as they were designed to measure adherence to oral medications. Thus, in view of the lack of specific questionnaires for inhaled drugs, a group of researchers from the Integrated Asthma and COPD Research Program (PII) of the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR) designed and validated the Test of Adherence to Inhalers (TAI).[6] This test can be used to identify not only patients with poor adherence, but also to establish the degree of adherence (good, intermediate, poor) and flag the type or pattern of non-compliance (sporadic, deliberate and unconscious), both in asthma and in COPD. It consists of 2 complementary questionnaires: the 10-item TAI, completed by the patient, which identifies patients with poor adherence and their level of adherence, and the 12-item TAI, completed by the patient and the health professional, which flags the pattern of non-compliance. The questionnaire for standard clinical practice can be downloaded free of charge from http://www.taitest.com, and permission to use the test in research can be requested on the same website.

The validation study, conducted in 1009 patients (500 asthmatics and 410 COPD patients; and a control group of 99 asthmatics in whom adherence was measured with electronic devices), showed that the TAI has good psychometric properties (reliable, homogeneous, and unidimensional), excellent internal validity (Cronbach's alpha=0.873), and a test–retest reliability of 0.883.[6] Compared to the Morisky–Green test, TAI showed a slight, but significantly better ($P<.05$) correlation with adherence determined using Smartinhaler® electronic devices ($\rho=0.286$ vs $\rho=0.247$). It also revealed other interesting results when the 2 patient groups were compared: the prevalence of good adherence was significantly greater in COPD (49%) than in asthma (28%); and COPD patients had a significantly higher proportion of unconscious non-compliance, and a lower rate of sporadic errors than asthmatics.[7]

The fact that the TAI also gives an idea of the non-compliance pattern is an additional advantage over other questionnaires not specifically designed for inhalers. Logically, the correction of sporadic errors (dosing reminder tools, probably managed via e-medicine[8]) will be very different from correction of deliberate

(motivational interview[9]) or unintended non-compliance (personalized program and reiteration of educational messages).

The questionnaire has been rapidly and widely accepted in Spain and abroad, and validation studies in the main European languages will be undertaken shortly. A Spanish multicenter study was launched recently (RE-TAI Project), which aims to determine if combining the results obtained from the TAI with an electronic registry of prescription collection will improve its ability to identify deficient adherence. The results of a preliminary pilot study conducted in a small sample of patients tended to support this premise.[10]

The reliability of information provided by the TAI (and self-administered questionnaires in general) has been questioned, since patients can falsify their responses to conceal a possible lack of adherence. Although this is a possibility, the TAI validation study[6] confirmed that its results are reasonably reliable when compared with those of the control group (obtained using electronic devices), as mentioned above.

In the current medical scientific era of the "omes" (metabolome, genome, etc.), perhaps we should include the term "adhesome" in the list. Increasing the rate of therapeutic compliance is a key factor in achieving adequate disease control. Instead of developing more effective and safe (and more expensive) molecules, the greatest challenge nowadays may be to achieve better therapeutic adherence among our patients. The first step is to measure adherence, and to this end, the TAI is an inexpensive, immediate and reasonably reliable tool that can be used to flag non-compliance patterns, and to guide subsequent specific corrective action.

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Conflict of Interests

In relation with this publication, the authors (VP, ALV and BGC) state that they have received fees as members of the Scientific Committee of the Chiesi TAI Project.

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