Respiratory Medicine (2014) 108, 358–365

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/rmed

Impact of patients' satisfaction with their inhalers on treatment compliance and health status in COPD

Henry Chrystyn [a,*], Mark Small [b], Gary Milligan [b], Victoria Higgins [b], Esther Garcia Gil [c], Jordi Estruch [d]

[a] Division of Pharmacy and Pharmaceutical Sciences, University of Huddersfield, Queensgate, Huddersfield HD1 3DH, UK
[b] Adelphi Real World, Adelphi Mill, Grimshaw Lane, Macclesfield SK10 5JB, UK
[c] Almirall, Sant Feliu R&D Centre, Laureà-Miró, 408-410, 08980 Sant Feliu de Llobregat, Barcelona, Spain
[d] Almirall, Ronda General Mitre, 151, 08022 Barcelona, Spain

Received 8 May 2013; accepted 23 September 2013
Available online 2 October 2013

KEYWORDS
Chronic obstructive pulmonary disease (COPD);
Compliance;
Exacerbations;
Inhaler devices;
Satisfaction

Summary
Objective: To examine the relationships between inhaler satisfaction, treatment compliance and health status in patients with chronic obstructive pulmonary disease (COPD).
Methods: In a large, multinational, cross-sectional, real-world survey, respiratory specialists and primary care physicians provided information on six consecutive patients with COPD, who were then asked to complete a questionnaire. Physician-assessed compliance was scored (5-point Likert scale) and patients rated overall satisfaction with their maintenance inhaler (7-point Likert scale). Health status assessments included frequency of exacerbations and hospitalizations due to exacerbations in the past 12 months.
Results: The analysis included 1443 patients (71.8% male; mean age 65.2 years). Patients' overall satisfaction with their inhaler was significantly associated with treatment compliance ($\chi^2 - df = 89.7$; $p < 0.001$). Male gender ($\chi^2 - df = 2.9$; $p < 0.05$) and fewer maintenance drugs ($\chi^2 - df = 17.7$; $p < 0.001$) were also associated with compliance; age and breathlessness severity were not. Attributes influencing inhaler satisfaction mainly related to durability, ergonomics and ease of use. Small but statistically significant associations were observed between increasing treatment compliance and fewer exacerbations ($R^2 = 0.037$; $p < 0.001$) and fewer hospitalizations due to exacerbations ($R^2 = 0.025$; $p < 0.001$). There was a direct association between inhaler satisfaction and fewer exacerbations ($R^2 = 0.03$; $p < 0.001$).

* Corresponding author. Tel.: +44 1484 472 783; fax: +44 1484 472 182.
E-mail addresses: h.chrystyn@hud.ac.uk, h.chrystyn@gmail.com (H. Chrystyn).

0954-6111/$ - see front matter
http://dx.doi.org/10.1016/j.rmed.2013.09.021

Conclusions: Treatment compliance appears to be modestly associated with inhaler satisfaction, better health status and less frequent COPD exacerbations, although other factors are also likely to be involved. Durability, ergonomics and ease-of-use are inhaler attributes that influence patient satisfaction.

Introduction

Chronic obstructive pulmonary disease (COPD) is a common, usually progressive respiratory disease characterized by persistent airflow limitation [1]. COPD is a major cause of morbidity and mortality globally and is associated with significant economic and social burden [1].

Inhaled medications, including short- and long-acting bronchodilators and corticosteroids, are central to COPD therapy [1]; however, in order to achieve maximal clinical benefit, it is important that patients are able to use their inhaler devices correctly and that they adhere to prescribing instructions [2—5]. In common with other chronic diseases, adherence to or compliance with prescribed therapies has been widely reported to be suboptimal in patients with COPD [2,4—8]. Between 40% and 60% of patients with COPD do not adhere to their prescribed medications and between 4% and 95% of patients fail to use their inhalers correctly, depending on inhaler type and assessment method [3,5,9].

Patients with COPD may be prescribed a number of separate inhalers for the delivery of short-term relief medications and maintenance therapy, each requiring different techniques. Ensuring that patients are able to use their different inhaler types correctly may be an important strategy to increase patient satisfaction and, consequently, improve treatment compliance and clinical outcomes in COPD. However, whilst compliance has been reported to be positively influenced by inhaler satisfaction in patients with asthma [10—13], there is a lack of data demonstrating a causal relationship in COPD [14].

Using data from the Adelphi Respiratory Disease Specific Programme (DSP®; Adelphi, Macclesfield, UK), the objectives of the analysis reported in this paper were to identify the factors, including patient characteristics and patient-reported inhaler satisfaction, which are significantly associated with treatment compliance, to examine the influence of specific inhaler attributes that contribute to overall inhaler satisfaction, to report on the relationships between compliance and health status and resource use, and to explore the direct association of inhaler satisfaction with health status.

Methods

Study design

The Respiratory DSP® was a large, cross-sectional survey of real-world clinical practice that was conducted in France, Germany, Italy, Spain and the UK between June and September 2009, as reported in detail elsewhere [15]. Respiratory specialists and primary care physicians were identified locally, from public lists of healthcare professionals, to provide a sample of physicians that was representative of healthcare professionals managing patients with COPD in each participating country. A pragmatic sample size was used, consistent in each country. Proportional stratification sampling was not implemented. In order to avoid selection bias, a proportionately larger sample of physicians was identified in areas of high population density than in areas of low population density.

Eligibility was determined based on specialty, personal responsibility for treatment decisions and number of patients with COPD seen in a typical week. Eligible physicians who accepted an invitation to participate in the study were asked, via patient record forms, to provide information on their next six consecutive patients consulting with COPD (as confirmed by participating physicians), who had airflow obstruction, were aged at least 40 years and had a history of smoking. These patients were then invited by the physician to independently and voluntarily complete a confidential questionnaire (patient self-completed form), which was returned in a sealed envelope.

The Respiratory DSP® was conducted in accordance with the European Pharmaceutical Market Research Association (EphMRA) code of conduct for international healthcare market research [16], and all participating patients provided informed consent. Ethical approvals were, therefore, not required. To ensure compliance with data protection laws, all data were de-identified and aggregated prior to receipt by Adelphi Real World.

Physician-reported variables

Physician-reported data included patient demographics and disease characteristics. COPD severity was reported based on physicians' clinical judgment, which may have considered other information in the patients' medical records in addition to spirometry findings. Additionally, the modified Medical Research Council (mMRC) dyspnea scale [17] was used to measure the level of patient breathlessness on a scale from 0 ('only gets breathless after exercising heavily') to 4 ('too breathless to leave the house'). The number of COPD exacerbations experienced by patients in the past 12 months was also recorded with details of where they were managed (primary care, emergency room or hospitalization). For the purposes of this study, an exacerbation was defined as a worsening of COPD symptoms that could not be brought under control by relief medication.

Treatment compliance was defined as the extent to which patients were assessed by their physician to follow their prescribing instructions and advice. It was rated by physicians, based on perceived frequency of medication administrations per day, using a 5-point Likert scale,