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Specific, but not general beliefs about medicines are associated with medication adherence in patients with COPD, but not asthma: Cohort study in a population of people with chronic pulmonary disease☆

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ABSTRACT

Background: Beliefs about medicines are regarded as influencing factors on medication adherence (Horne, 1997). Adherence levels in patients with chronic pulmonary diseases are low (Bourbeau and Bartlett, 2008; Sumino and Cabana, 2013). A better understanding of the predictive role of patients' beliefs about medicines for adherence might be a crucial step to improve medication adherence.
Objective: This prospective study investigated the association between beliefs about medicines and medication adherence in patients with asthma and COPD.
Methods: The Beliefs about Medicines Questionnaire (BMQ) and the Medication Adherence Rating Scale (MARS) were administered to 402 patients (49% asthma, 51% COPD, 50% female, mean age 56.7 years (SD = 15.9)) at baseline. Follow-ups were carried out after 3 (N = 255) and 12 months (N = 171). Multivariable logistic regression analyses were performed analysing the association between the BMQ subscales at baseline and adherence at each follow-up inquiry. Sociodemographic, psychosocial, and disease related factors were considered as potential confounders.
Results: One third of the patients showed adherent behavior (18% and 46% of people with asthma and COPD). In the COPD sample, the subscale Specific-necessity showed a significant positive association with adherence at the 3-months-follow-up (OR = 2.6, 95% CI 1.4–5.1) and the subscale Specific-concerns showed a significant inverse association with adherence at the 3-months-follow-up (OR = 0.6, 95% CI 0.3–0.95) and the 12-months-follow-up (OR = 0.4, 95% CI 0.2–0.8). No significant association was found for the asthmatic sample.
Conclusions: Beliefs about medicines are important factors predicting future medication adherence in patients with COPD, but not asthma. Physicians should primarily focus on the specific beliefs of their patients in order to diminish medication non-adherence.

1. Introduction

Asthma and COPD are chronic pulmonary diseases with a significant airflow obstruction being reversible in asthma [4] and constant in COPD [5]. Cough and shortness of breath are major symptoms affecting both types of patients either with COPD [6] or asthma [5]. As chronic diseases, asthma and COPD present a substantial economic burden on our health system [7].

Treatment regimes in both diseases involve pharmacological (corticosteroids and bronchodilatators), and non-pharmacological strategies (e.g. smoking cessation) [4,5]. Improvement of health status can be obtained by optimal therapy management in both groups of patients [8], reducing risks of exacerbations [9], and the number of hospital admissions [10]. Effective therapy management requires patients with asthma or COPD to adhere to the medication prescribed. However, adherence has been found to be low in patients with chronic pulmonary diseases such as asthma and COPD [2,3], ranging from 40 to 70% in different studies [11–14]. In order to identify ways to improve

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adherence in patients with chronic pulmonary disease, it is very important to investigate factors influencing adherence.

Sociodemographic factors (e.g. sex, age, education), clinical (duration of illness) and care-related variables (number of hospital visits) only correlate weakly with reported adherence [12,15,16].

Patients' illness perception and beliefs that people with chronic disease hold about their medicines have moved into the focus of current adherence to treatment research [1]. The concept of these beliefs is derived from different conceptual models. One of them is the common sense model that states that a patient has to deal with two different aspects regarding the illness representation. On the one hand he or she has to deal with the perceived health threat of the disease (cognitive level) and on the other hand with the emotional reactions to this threat (emotional level). The processing of these aspects is further influenced by psychological and biological aspects of the individual and by sociocultural aspects among them beliefs about medication [17]. Another concept of adherence-related beliefs is the Necessity-concerns framework which suggests that patients' adherence depends mainly on two aspects: their perception of their personal need for treatment (necessity beliefs) and their fear of potential negative consequences [18]. According to this framework Horne structured beliefs about medicines into five domains: Specific-necessity, Specific-concerns, General-harm, General-overuse and General-utility [1,19], represented in the Beliefs about Medicines Questionnaire [20]. These beliefs have been used to predict medication adherence in chronically ill patients [15,21].

In asthma, patients' concerns about their medication as well as their perception that medication is generally harmful and overused have been linked to lower levels of adherence [15,16,22]. Further studies showed a positive relationship between Specific-necessity and medication adherence in patients with asthma [14,23,24], and a higher risk of non-adherence in patients who were more concerned about their asthma medication [13]. For COPD patients, fewer studies have investigated the association of beliefs about medicines and medication adherence [12,25,26]. Supporting the findings of research in patients with asthma, their results showed that higher concerns increase the risk of non-adherence while patients with a stronger belief in the necessity of their medication reported being adherent more often.

A better understanding of the role beliefs about medicines play for medication adherence of patients with asthma and COPD could be a crucial step in the improvement of patients' medication adherence and consequently, health and cost outcomes [27].

We could find only one other prospective study investigating factors influencing adherence in respiratory disease and the focus of this study was on inhaler maintenance in patients with asthma in Australia [28]. We did not identify any prospective study with a follow-up period beyond one month nor in patients with COPD. However, more longitudinal studies are warranted to analyse a potentially causal relationship of the association between medication beliefs and adherence and also because behavior change is a dynamic process [14].

Therefore, the aim of this study was to investigate the association between beliefs about medicines and medication adherence in patients with COPD and asthma in a prospective manner. In particular, we wanted to test the hypotheses that the scores of the BMQ subscales Specific-concerns, General-overuse and General-harm are inversely associated and the scores of the subscales General-utility and Specific-necessity are positively associated with medication adherence.

2. Material and methods

2.1. Study design

For the baseline survey, patients with COPD and asthma were recruited from June 2013 to December 2014 from different hospitals, primary care and specialists practices in the area of Regensburg, Germany. Inclusion criteria were: main diagnosis of asthma or COPD made by a physician; disease duration at least 3 months; age ≥ 18 years. Patients without sufficient understanding of the German language and with acute psychiatric and neurological diseases (except for depression and anxiety disorders) were excluded. Patients' written informed consent was obtained. Data was collected by means of questionnaires and from patients' medical files. Follow-ups were performed after three (September 2013 to March 2015) and 12 months (June 2014 to December 2015). Questionnaires were sent by post. Reminder were sent by post. Patients were contacted by telephone if no response was obtained after sending the reminder in order to gain a good sample for both follow-up inquiries.

2.2. Data collection

2.2.1. Outcome measure: adherence to medication

At each point in time of our longitudinal study (baseline, after 3 months, after 12 months) adherence to medication was measured by the German version of the Medication Adherence Report Scale (MARS) which has been described as an appropriate questionnaire to detect non-adherence [29]. Each of the five items of the MARS is scored from 1 (always) to 5 (never). The adherence score is derived from the sum of the five item scores. As the MARS scores were skewed to the right, we dichotomized adherence. A score of 25 defines adherence, a score < 25 non-adherence according to George et al. [26]. Sensitivity analyses with cut-off MARS scores of 23 and 22 were performed.

2.2.2. Explanatory variables: beliefs about medicines

The German version of the Beliefs about Medicines Questionnaire (BMQ) [20,30] was administered, which has been shown as an appropriate instrument to measure patients' beliefs about medicines [21]. The BMQ is a 23-item questionnaire with five scales: The BMQ Specific-necessity (patients' beliefs about how important their personal medication is for their health), the BMQ Specific-concerns (patients' worries about negative effects of their medication), the BMQ General-overuse (addressing the statement that medicine is overused), the BMQ General-harm (addressing beliefs that medication is harmful and poisonous) and the BMQ General-utility (addressing beliefs that medication is useful to improve patients' health status) [19,20]. Each item is scored on a 5-point Likert scale. A lower score indicates disagreement, while a higher score indicates agreement [20]. BMQ subscale scores were calculated as mean scores of corresponding items and range from 1 to 5. The mean scores of subscale scores were used for statistical analysis.

2.2.3. Potentially confounding variables

2.2.3.1. Patients' characteristics. Sociodemographic data (age, sex, level of education, living situation) was collected. Educational level was subdivided into the categories low (< 10 years of school attendance), medium (10 years of school attendance) and high (> 10 years of school attendance). At baseline, the number of current smokers and the number of daily cigarettes was collected for patients with COPD only, but was asked for both groups at follow-up one and two.

2.2.3.2. Disease characteristics. Information about the time since the diagnosis of asthma or COPD as well as the number of comorbidities were collected. At baseline, information on the number of exacerbations in the last months was collected for patients with COPD only and for both groups of patients at the follow-ups. The presence of side effects was collected at each inquiry for all patients.

Asthma and COPD severity was measured using the forced expiratory volume in 1 s (FEV_1), the COPD assessment test (CAT) [31] and the Asthma Control Questionnaire (ACQ) [32]. COPD severity was classified into the four GOLD categories according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) [5].

The CAT consists of eight items with six categories (0 = no impairment, 5 = strong impairment) that cover a broad range of COPD associated symptoms and effects on patients' lives [31]. Studies describe it as a reliable measure of COPD severity [31] with good validity [33].