

Socio-economic Status and Adherence to Treatment in Asthma: predictors in a Programme for Asthma Control in Salvador, Brazil.

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Abstract

In Brazil, like many others low- to middle-income countries most asthmatic patients cannot afford the medication necessary to prevent exacerbations. The reference clinic of the Programme for Asthma Control in Bahia (ProAR; Salvador-Bahia) offers free medical care, pharmaceutical assistance (inhaled medication) and patient education. The reference clinic is accessible to all population. This local Programme is targeted on severe asthma. Our group studied adherence to inhaled medication in 160 severe asthmatics enrolled in ProAR. Of the one hundred-sixty patients with severe asthma included, it was possible to objectively assess adherence to the use of the inhaled corticosteroid prescribed in 158. Among these, 112 (70.9%) were considered adherent according to the adopted cut-off point. The rate of adherence in the whole sample of subjects was 83.9% of the prescribed doses. There was a significant association between asthma control and adherence to treatment. Predictors of poor adherence were adverse effects, living far from the referral center, limited resources to pay for transportation and dose schedule. Poor adherence is common and is closely associated to asthma morbidity. Non-adherence to treatment is not simply the result of a patients' deficiency. Adherence reflects overcoming obstacles such as access to medication, understanding of disease and its management, easy communication between health professionals and patients, and education programs fitted to health providers, patients and their families.

Introduction

Asthma is a chronic inflammatory disease characterized by symptoms such as dyspnoea, chest tightness, wheezing and cough. The goals of asthma treatment are to control the clinical manifestations and improve lung function [1].

There is evidence that reducing inflammation with therapy leads to clinical control. Inhaled glucocorticosteroids are the most effective controller medications currently available [1]. However, asthma management and symptoms' control are not so easy to obtain. According to the World Health Organization, the definition of adherence is “the extent to which person’s behavior – taking medication, following a diet and executing lifestyle changes, corresponds with agreed recommendations from a health care provider” [2].

Several factors may influence adherence to treatment and asthma control such as patients' knowledge about their disease, cultural and socioeconomic aspects, poor perception of asthma symptoms, side effects and skills to use inhalator devices [3-7]. In this study we review adherence and non-adherence to treatment of asthmatic patients, with emphasis in our experience on a reference center for control of severe asthma in Brazil.

General aspects of asthma

Symptoms of asthma increased worldwide in the last decades following trends of urbanization. This chronic inflammatory syndrome affects approximately 300 million people of all ages. It has been estimated that asthma is responsible by 15 million disability-adjusted life days year (DALY's) and 250 thousand deaths/year in the world [8].

Airways inflammation from the nose towards to lungs has been identified and well characterized in asthmatic patients [9]. This pattern is associated with hyper-responsiveness and asthma symptoms. Persistent inflammation does not keep a strong correlation with intensity and frequency of asthma symptoms, though. Nonetheless, there is evidence that structural and inflammatory changes of the distal airways are related to disease severity. More recently, Dolhinikof et al [10] observed that the outer area of the small airways was a major site of extra cellular matrix (ECM) remodelling in fatal asthma.

Concerned asthma treatment, inhaled corticosteroids are now recommended as first-line therapy for asthma [1]. These drugs clearly improve the symptoms of the disease and the associated physiologic abnormalities, asthma morbidity and mortality [11].

Lack of adherence to asthma therapies

In all chronic diseases, including asthma, patient non-adherence to medical recommendation is common. Patients with chronic diseases less frequently adhere to treatment when compared to patients acutely affected. In addition, compliance to medical prescriptions tend to decline steeply overtime [12]. Patients with chronic diseases in high-income countries frequently do not use their medications as recommended by clinicians. In low- and middle-income countries, non-adherence is more critical due to the mix of limited access to health care, lack of appropriate diagnosis, and low availability or affordability of essential medicines [12].

The use of inhaled corticosteroids contributes effectively and safely to the control of persistent asthma. Adherence to therapy is crucial to the success of the treatment. Studies of adults and children have shown that some 50% of those on long-term therapy fail to take medications as directed. Complete discontinuation of the asthma treatment will probably result in clinical deterioration, exacerbation and may contribute to poor clinical outcomes [13-15]. Patient's concern about side effects of inhaled glucocorticosteroids may influence adherence. Non-adherence at a clinical level is detected by asking the patient directly about the use of the prescribed therapy. Nevertheless, self-report does not seem to be an accurate way to assess adherence.

In a Brazilian survey, Chatkin et al observed adherence to asthma therapy in 51.9% of individuals. The authors also showed that the most severe asthma symptoms were associated to higher adherence to asthma therapy [4]. The reasons for patient's non-adherence are complex and are frequently related to patients themselves, health care professionals, health care system, medications and inhalation devices.

Barriers related to non adherence in asthma

Asthma control is poor worldwide. Poor knowledge of disease, lack of access to medication, difficulties in the understanding of proper medication use and inhaler techniques contribute significantly to this problem, specially in low-incoming settings. In Lagos-Nigeria, 106 patients with uncontrolled asthma were evaluated by specialists [16]. The most expressive conclusion was that the majority of the asthmatics did not receive any health education about their disease after consultation and 52.8% had poor inhaler technique. Regular assessment and reinforcement of correct inhalation technique by health professionals and caregivers are considered to be an essential component of successful asthma management. Nonetheless, standard and basic education offered to asthmatic patients about their disease routinely seems to be insufficient and do not match patients' expectation nor needs.

Inadequate knowledge on the use of asthma inhalation devices by healthcare professionals has been well documented. A metanalysis evaluated the skills of physicians, medical students, pharmacists, nurses, and respiratory therapists in using asthma inhalation devices. The results of this study showed lack of skills on using metered-dose inhalers, spacers, and dry powder inhalers of the majority of healthcare professionals [17]. Stelmach et al demonstrated that face-to-face to a typical patient with uncontrolled persistent asthma, physicians are able to correctly identify the drugs indicated for treatment but not adequately instruct about the technique for the use of metered-dose inhalers [18]. These results clearly demonstrated that basic continued

education to physicians and health professionals is crucial to improve asthma management.

Predictors of adherence and preliminary results of a local Programme for Asthma Control in Bahia, Brazil

Reference center of the Programme for Control of Asthma in Bahia (ProAR)

In Brazil, like many others low- to middle-income countries most asthmatic patients cannot afford the medication necessary to prevent exacerbations. The reference clinic of the Programme for Asthma Control in Bahia (ProAR; Salvador-Bahia) offers free medical care, pharmaceutical assistance (inhaled medication) and patient education. The reference clinic is accessible to all population. This local Programme is targeted on severe asthma. Patients use combined inhaled corticosteroid (beclomethasone or budesonide) and a long acting b2 agonist (formoterol) for maintenance, plus a short acting inhaled b2 agonist (fenoterol) for rescue [1]. Additionally, patients and their families receive educational classes and multidisciplinary care by members of our team: pharmacists, nurses, psychologist and clinicians.

A preliminary study comparing patients with severe asthma one year before and one year after admission to ProAR demonstrated that such intervention markedly reduced asthma morbidity in above 80% of these individuals [19]. (Table 1). This result suggests that a regular use of prescribed medication was achieved.

Predictors of adherence in severe asthmatics in a referral clinics in Salvador-Bahia, Brazil.

A sub-group of 160 consecutive severe asthmatics enrolled in ProAR were followed prospectively for 6 months to quantify objectively adherence to inhaled medication. Data about socioeconomic and demographic characteristics; history of asthma; severity of the symptoms based on the Asthma Control Questionnaire [20]; medication used; symptoms of depression [21] and beliefs; acceptance of the disease; knowledge of the benefits and risks of the treatment; and degree of communication with the health professionals who monitored the patient were collected. Patients also underwent pulmonary function tests (spirometry) for evaluation of the functional response to the treatment. At the end of each monthly visit, the patients received sufficient medication to use until the next visit, was instructed to fill a register with the missed doses and return the packages of the medication dispensed in the previous visit. Powder capsules/inhaler returned were counted or weighed.

Statistics

Data were analyzed using the Statistical Package for the Social Sciences, version 9.0 (SPSS Inc., Chicago, IL, USA). A logistic regression model was used for adjusting potential confounding factors.

The level of statistical significance was set at $\alpha < 0.05$. The degree of association among the studied variables was evaluated using odds ratios with a confidence interval of 95%. The authors adopted a cut-off point of 80% of the doses prescribed in the period to define patients as adherent. This value was adopted taking account the severity of the disease and the availability of free medication to all of the patients.

Of the one hundred-sixty patients with severe asthma included (Table 2), it was possible to objectively assess adherence to the use of the inhaled corticosteroid prescribed in 158. Among these, 112 (70.9%) were considered adherent according to the adopted cut-off point. The rate of adherence in the whole sample of subjects was 83.9% of the prescribed doses.

There was a significant association between asthma control and adherence to treatment. Predictors of poor adherence were adverse effects, living far from the referral center, limited resources to pay for transportation and dose schedule (Table 3). Other factors of concern, such as symptoms of depression, religion and economic status, were not associated with poor adherence in our study.

Conclusion

Poor adherence is common and is closely associated to asthma morbidity. Non-adherence to treatment is not simply the result of a patients' deficiency. Adherence reflects overcoming obstacles such as access to medication, understanding of disease and its

management, easy communication between health professionals and patients, and education programs fitted to health providers, patients and their families.

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