Respiratory Medicine (2013) **107**, 511–518

Available online at www.sciencedirect.com

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

Discordance between asthma control clinical, physiological and inflammatory parameters in mild asthma☆

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Received 24 October 2012; accepted 21 December 2012
Available online 11 January 2013

KEYWORDS
Asthma;
Asthma control;
Perception;
Respiratory symptoms;
Expiratory flows;
Lower airway inflammation

Summary
Background: Discrepancies have been observed between clinical, physiological, and inflammatory asthma control criteria, mostly in asthmatic subjects using regular inhaled corticosteroids (ICS) treatment. This study compared the prevalence of discrepancies between these 3 control parameters in mild asthmatic subjects not taking ICS.
Methods: A retrospective analysis of demographic data and results from the Asthma Control Scoring System tool was performed in mild patients with asthma not taking ICS. The % score obtained for the clinical (symptoms), physiological (FEV_1), and inflammatory (sputum eosinophil percentage) criteria were compared. Discrepancy was defined as a >20% difference between any 2 scores.
Findings: Data from 213 subjects with mild asthma were analysed. Discrepancies between clinical and inflammatory scores were observed in 32% of subjects, whereas 31% showed discrepancies between physiological and inflammatory scores, and 20% between clinical and physiological scores. Sub-analysis of the discrepancy groups showed that respectively 88% and 89% of subjects had a higher clinical or physiological score than inflammatory score. Twenty-seven percent of subjects had residual airway inflammation despite adequate clinical control and optimal pulmonary function.
Interpretation: There are significant discrepancies between scores of subjective and objective asthma control criteria. Airway inflammation often persists in subjects with good clinical or physiological asthma control scores. The consequences of this persisting airway inflammation in mild patients remain to be further studied.

☆ This work was performed at the Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Québec.

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0954-6111/$ - see front matter
http://dx.doi.org/10.1016/j.rmed.2012.12.015

Introduction

Asthma is a multi-faceted disease, characterised by symptoms, variable airflow obstruction, and lower airway inflammation. Current guidelines suggest that the main goal of asthma treatment should be an adequate control of the disease[1,2] and a reduction in future risk of exacerbations.[3] Until recently, asthma control was mostly defined according to subjective clinical features such as daytime and nighttime symptoms, rescue beta-2-agonist need, the ability to perform normal activities, absenteeism from work or school, and the severity and frequency of asthma exacerbations, and objective physiologic measures of expiratory flows.[1,2] Measurement of airway inflammation is increasingly considered useful in the management of asthma and the most recent Canadian Asthma Consensus Report recommends that sputum eosinophil measurement be included, in addition to standard measures of asthma control, to guide adjustment of controller therapy in adults with moderate to severe asthma, in centres where this technique is available.[4] We need however to better assess discrepancies between the 3 key components of asthma and determine what is the significance of those differences in regard to asthma management.

Discordance between clinical and physiological measures of asthma control have been previously studied.[5] More recently, a lack of concordance between lower airway inflammation and clinical asthma control parameters or pulmonary function has also been described[6–11] and residual eosinophilic airway inflammation has been associated with an increased risk of future asthma exacerbations in moderate/severe asthma.[12,13] However, these studies have been performed mostly in subjects using inhaled corticosteroids (ICS).

Subjects with mild persistent asthma form the largest group of asthma patients[14] and although they are well clinically controlled, they can experience asthma exacerbations.[15] Despite no or few symptoms, lower airway inflammation may be present in these subjects.[16] Still, the prevalence of these discrepancies and their impact on asthma control has not been determined in this population nor have potential long-term consequences of this feature been properly assessed.

The Asthma Control Scoring System (ACSS) is based on the asthma control criteria proposed by the Canadian Asthma Consensus Report,[17] these criteria being relatively close to those proposed by the Global initiative for Asthma (GINA).[2] It is a validated tool, that showed adequate measurement properties, both as an evaluative and as a discriminative instrument.[18] The ACSS is a composite score and it may therefore be useful to explore, quantitatively, discrepancies between the various manifestations of asthma and better define clinical phenotypes to help guide therapeutic decisions.

In this study, we looked at the prevalence and determinants of discrepancies between clinical, physiological, and inflammatory asthma control criteria, as reported by the ACSS, in mild asthmatic subjects not taking ICS.

Methods

Subjects and study design

This is an analysis of data from subjects presenting for initial assessment of asthma at the outpatient clinic of the Institut universitaire de cardiologie et de pneumologie de Québec or willing to take part to various studies on asthma pathophysiology and treatment, between 2003 and 2010 (Fig. 1). Data from subjects over 18 years old with a diagnosis of asthma, as defined by the Canadian Asthma Consensus Guidelines[1] for which the 4 clinical control parameters of the ACSS were documented, spirometry was performed (to provide a measure of FEV_1), and sputum induction with sufficient material for adequate analysis was

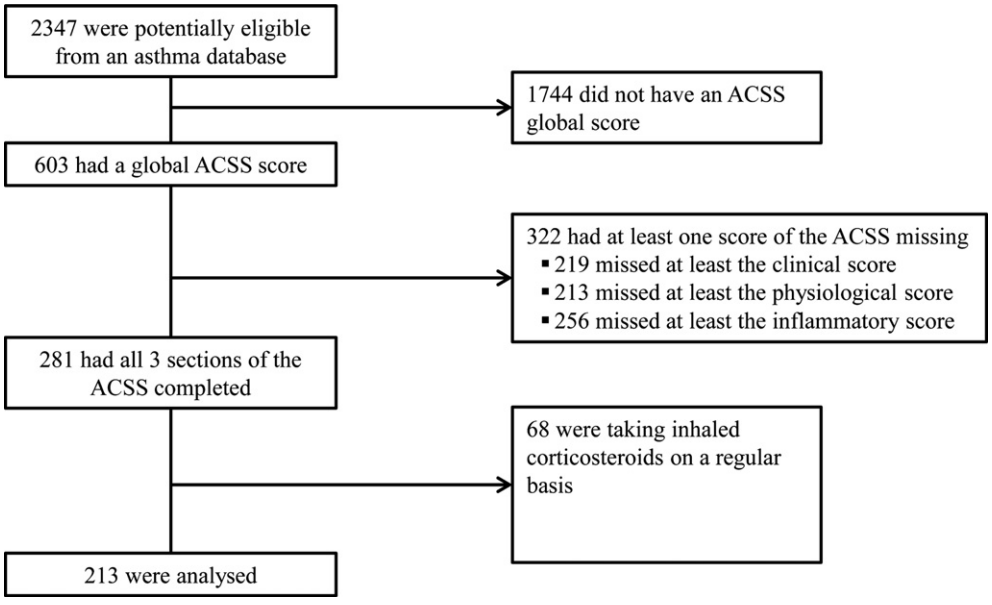

Figure 1 Visual representation of the number of patients who were screened and who completed the study.