CHEST

Dedicated Severe Asthma Services Improve Health-care Use and Quality of Life

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BACKGROUND: Systematic assessment of severe asthma can be used to confirm the diagnosis, identify comorbidities, and address adherence to therapy. However, the prospective usefulness of this approach is yet to be established. The objective of this study was to determine whether the systematic assessment of severe asthma is associated with improved quality of life (QoL) and health-care use and, using prospective data collection, to compare relevant outcomes in patients referred with severe asthma to specialist centers across the United Kingdom.

METHODS: Data from the National Registry for dedicated UK Difficult Asthma Services were used to compare patient demographics, disease characteristics, and health-care use between initial assessment and a median follow-up of 286 days.

RESULTS: The study population consisted of 346 patients with severe asthma. At follow-up, there were significant reductions in health-care use in terms of primary care or ED visits (66.4% vs 87.8%, $P < .0001$) and hospital admissions (38% vs 48%, $P = .0004$). Although no difference was noted in terms of those requiring maintenance oral corticosteroids, there was a reduction in steroid dose (10 mg [8-20 mg] vs 15 mg [10-20 mg], $P = .003$), and fewer subjects required short-burst steroids (77.4% vs 90.8%, $P = .01$). Significant improvements were seen in QoL and control using the Asthma Quality of Life Questionnaire and the Asthma Control Questionnaire.

CONCLUSIONS: To our knowledge, this is the first time that a prospective study has shown that a systematic assessment at a dedicated severe asthma center is associated with improved QoL and asthma control and a reduction in health-care use and oral steroid burden.

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ABBREVIATIONS: ACQ = Asthma Control Questionnaire; AQLQ = Asthma Quality of Life Questionnaire; GERD = gastroesophageal reflux disease; OC = oral corticosteroid; QoL = quality of life

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Approximately 5% of patients with asthma have severe treatment-refractory disease. This group of patients has a high direct health-care cost including medication burden and high indirect costs caused by lost productivity as a result of time off work or school. Within this group, some patients have severe treatment-refractory disease, whereas others may have an alternative diagnosis, and some may appear to have severe disease because of poor adherence to prescribed therapy.

Severe asthma is defined as asthma requiring treatment with guideline medications for GINA (Global Initiative for Asthma) step 4 to 5 (high-dose inhaled corticosteroids and long-acting β-agonists or leukotriene modifier/theophylline) for the previous year or systemic corticosteroids for ≥ 50% of the previous year to prevent it from becoming "uncontrolled" or that remains "uncontrolled" despite this therapy.[1] The British Thoracic Society/Scottish Intercollegiate Guidelines Network guidelines, the European Respiratory Society Task Force, and the American Thoracic Society Workshop on Severe Asthma have all highlighted a need for an integrated approach to assessing severe asthma.[1,2]

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At present, there is no standardized way that patients with severe asthma are assessed, and different asthma centers within the United Kingdom follow their own evaluation protocols. Previous studies evaluating the benefits of a systematic assessment have found that a coordinated series of investigations and assessments can highlight the mechanism of persisting symptoms, identify comorbid conditions, evaluate adherence to therapy, and confirm the diagnosis of severe asthma.[3,4] These factors can result in a targeted or personalized treatment approach, resulting in improved asthma symptoms and quality of life (QoL) and a tailored drug therapy, in addition to highlighting which patients may be suitable for alternative therapies such as novel biologic agents. To date, there has not been a prospective study confirming that a systematic approach results in these changes, and previous retrospective studies have not examined QoL.

Materials and Methods

In 2006, the British Thoracic Society Research Committee, together with physicians with a special interest in severe asthma, developed the National Registry for dedicated UK Difficult Asthma Services.[5] This project aimed to standardize specialist clinical services, to further define and characterize clinical phenotypes in subjects with well-characterized severe asthma, and to facilitate research into the assessment and management of difficult asthma. At present, 11 UK dedicated Specialist Difficult Asthma Services submit data to the National Registry. Patients referred with difficult asthma to centers within the National Registry undergo a set of coordinated investigations accompanied by a detailed history and examination. The National Registry is hosted online by Dendrite Clinical Systems Ltd and admits password-protected anonymized data after fully informed written consent has been obtained. Ethical approval for the National Registry was obtained from the Office for Research Ethics Committees Northern Ireland (ORECNI10/NIR02/37).

All patients underwent multiple investigations including a thorough medical history and examination, pulmonary function tests, allergy assessment (skin-prick testing, radioallergosorbent test, or both), and blood tests (incorporating blood eosinophil count and IgE). Investigations were performed according to the protocols at individual centers, and lung function % predicted values were calculated centrally. Skin-prick testing results were included for aeroallergens tested at all the centers.

Four hundred seventy-nine patients completed a systematic assessment between April 2009 and December 2010, of which 397 (81%) were deemed to have severe asthma.[6] Three hundred forty-six (70%) had follow-up data available and were eligible for entry into the study with a median follow-up period of 286 days (interquartile range, 248-376 days). Lung function, health-care use, medication burden, and QoL at baseline were compared with outcomes at follow-up using prospective data collection.

Statistical Analysis

Statistical analysis was performed using GraphPad PRISM 5. Baseline visits were compared with follow-up visits using Wilcoxon matched pairs testing. Categorical variables were compared using χ^2 analysis or the Fisher exact test as appropriate.

Results

Baseline demographics are shown in Table 1. Tables 2, 3, and 4 compare baseline and follow-up visits in terms of lung function, health-care use, corticosteroid use, and QoL.

The study used a minimum follow-up period of 100 days, with a range of 100 to 833 days and a median value of 286 days. Table 5 divides the cohort into tertiles (1 = shortest and 3 = longest follow-up period) according to the time between baseline and follow-up. Values are presented as No. (%) or median (interquartile range).

Baseline Demographics

There was a predominance of women (65.7%) and whites (89.8%) in the study population. A total of 8.7% were current smokers and 24.5% were ex-smokers with a median 14-pack-year (5- to 30.8-pack-year) smoking history. The median BMI was in the obese range (30.8 [25.8-36.3]), and the age at diagnosis was 16 years (4-33 years), with age at time of assessment of asthma at 46 years (34-55 years).